In the Supreme Court of the United States

OCTOBER TERM, 1975

Nos. 75-567, 75-577

STATE OF OREGON, Acting by and through the State Land Board,

Petitioner,

v.

CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation,

Respondent.

CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation,

Petitioner,

v.

STATE OF OREGON, Acting by and through the State Land Board,

Respondent.

On Writ of Certiorari to the Supreme Court of the State of Oregon

Petitions for Certiorari filed
October 14, 1975 (No. 75-567) and
October 15, 1975 (No. 75-577)
Certiorari Granted January 12, 1976

JOINT APPENDIX

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RELEVANT DOCKET ENTRIES IN TRIAL COURT

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR BENTON COUNTY

12/23/69	Filed: State's First Amended Complaint
4/23/70	Filed: Corporation's Demurrer
5/27/70	Entered: Order—Overruling Demurrer
7/23/71	Filed: Corporation's Third Amended Answer
8/ 1/71	Filed: State's Reply
10/ 5/71	Pre-trial Hearing
10/11-15, 21-22/71)	TRIAL
5/ 3/72	Hearing on matters stricken from Corporation's pleadings
5/25/72	Entered: Memorandum Opinion
6/19/72	Entered: Findings of Fact and Conclusions of Law
6/15/72	Filed: State's Objections
7/ 3/72	Filed: Corporation's Objections
7/ 6/72	Hearing on Objections to Findings
7/28/72	Entered: Supplement to Court's Findings of Fact and Conclusions of Law
7/28/72	Entered: Judgment
8/25/72	Filed: State's Notice of Appeal

9/ 1/72 Filed: Corporation's Notice of Cross-Appeal

9/ 8/72 Filed: Corporation's Supplemental Designation of Record

12/22/72 Filed: Transcript

2/13/73 Filed: Motion to Correct Transcript

3/29/73 Entered: Order—Correcting Transcript

5/14/73 Entered: Order—Settling Transcript

RELEVANT DOCKET ENTRIES IN APPELLATE COURTS

I.

COURT OF APPEALS OF THE STATE OF OREGON

7/23/73 Filed: State's Appellant's Brief

1/ 2/74 Filed: Corporation's Cross-Appellant's and Respondent's Brief

4/17/74 Filed: State's Reply Brief

6/27/74 Record received

7/ 1/74 Filed: Corporation's Reply Brief

7/15/74 Oral Argument: Court of Appeals

9/ 9/74 Opinion Entered (Schwab, CJ)

8/12/75 Issued: Court of Appeals Mandate

II.

SUPREME COURT OF THE STATE OF OREGON

10/ 9/74 Filed: State's Petition for Review (copy to Court of Appeals)

10/ 9/74 Filed: Corporation's Petition for Review (copy to Court of Appeals)

10/22/74 Court of Appeals declined to reconsider its opinion

1/28/75 Denied: State's Petition for Review

1/28/75 Allowed: Corporation's Petition for Review

2/28/75 Filed: State's Supplemental Brief

3/24/75 Filed: Corporation's Reply to Supplemental Brief

4/ 3/75 Oral Argument: Supreme Court

6/12/75	Opinion Entered: Affirmed Court of Appeals as modified
6/20/75	Filed: State's Petition for Rehearing
7/ 3/75	Filed: Corporation's Petition for Rehearing
7/15/75	Petitions denied; Opinion clarified
7/22/75	Filed: Corporation's Motion to Withdraw or Suspend Clarification of Opinion
8/ 6/75	Denied: Corporation's Motion to Withdraw
8/ 7/75	Issued: Supreme Court's Mandate
8/21/75	Issued: Corrected Supreme Court's Mandate

No. 21512—December 23, 1969

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff, vs. CORVALLIS SAND & GRAVEL COMPANY, an Oregon corporation, Defendant.	No. 21512 FIRST AMENDED COMPLAINT (Action at Law for the Recovery of the possession of Real Property)

I

The defendant is a corporation duly organized and created under the laws of the State of Oregon.

II

The Willamette River is a navigable river located wholly within the State of Oregon and is navigable at the locations hereinafter described.

III

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 1 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor, which parcel is more particularly described by the legal

description set forth in Exhibit "A" which is annexed hereto and thereby made a part hereof.

IV

Said parcel lies wholly within that portion of the bed of the Willamette River which lies between the lines of ordinary low water.

V

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of the original Complaint in this action has wrongfully and continuously withheld the aforesaid described real property from the plaintiff.

VI

The reasonable value of the use of said premises for each year of the six years immediately prior to the filing of the original Complaint in this action is, to-wit: $25,000. The reasonable value for the use of said premises for each year during the pendency of this action is, to-wit: $25,000.

FOR A SECOND, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES AS FOLLOWS:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of

the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 2A on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor, which parcel is more particularly described by the legal description set forth in Exhibit "B" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River which lies between the lines of ordinary low water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforesaid described real property from the plaintiff.

V

The reasonable value of the use of said premises for each year of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $6,356.38. The reasonable value for the use of said premises for each year during the pendency of this action following the filing of this First Amended Complaint is, to-wit: $6,356.38.

FOR A THIRD, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 2B on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor, which parcel is more particularly described by the legal description set forth in Exhibit "C" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its right bank which lies between the line of ordinary low water and the line of ordinary high water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforesaid described real property from the plaintiff.

V

The reasonable value of the use of said premises for each year of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $1,589.10. The reasonable value for the use of said premises for each year during the pendency of this section following the filing of this First Amended Complaint is, to-wit: $1,589.10.

FOR A FOURTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 2C on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor, which parcel is more particularly described by the legal description set forth in Exhibit "D" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its right bank which

lies between the line of ordinary low water and the line of ordinary high water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforesaid described real property from the plaintiff.

V

The reasonable value of the use of said premises for each of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $1,035.03. The reasonable value for the use of said premises for each year during the pendency of this action following the filing of this First Amended Complaint is, to-wit: $1,035.03.

FOR A FIFTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and, except as otherwise alleged in paragraphs IV and V of this cause of action, entitled to the immediate

possession of that parcel of real property which is designated as Parcel No. 3 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor, which parcel is more particularly described by the legal description set forth in Exhibit "E" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River which lies between the lines of ordinary low water.

IV

On July 1, 1963 the plaintiff entered into a lease with the defendant under which lease plaintiff leased to the defendant for a term of 10 years the following described real property:

> That portion of the bed of the Willamette River owned and controlled by the State of Oregon beginning at its confluence with East River (East Channel of the Willamette River) and extending downstream 4,000 feet, all in Section 2, Township 12 South, Range 5 West, Willamette Meridian.

The real property described in said lease includes all or substantially all of the real property described as Parcel No. 3 herein. A true copy of said lease is annexed hereto and thereby made a part hereof and designated Exhibit E-1.

V

Defendant does now wrongfully withhold the possession of Parcel 3 from the plaintiff and for the six

years immediately prior to the filing of the original Complaint in this action has wrongfully and continuously withheld Parcel 3 from the plaintiff except to the extent that said parcel is included in the property leased from plaintiff to defendant under the aforesaid lease.

VI

The reasonable value of the use of said premises for each year of the six years immediately prior to the filing of the original Complaint in this action is, to-wit: $5,000. The reasonable value for the use of said premises for each year during the pendency of this action is, to-wit: $5,000.

FOR A SIXTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 4 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor, which parcel is more particularly described by the legal description set forth

in Exhibit "F" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River which lies riverward of the most easterly line of ordinary low water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforesaid described real property from the plaintiff.

V

The reasonable value for the use of said premises for each year of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $15,000 a year. The reasonable value for the use of said premises for each year during the pendency of this action following the filing of this First Amended Complaint is, to-wit: $15,000 a year.

FOR A SEVENTH FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and

at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 5 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor which parcel is more particularly described by the legal description set forth in Exhibit "G" which is annexed hereto and thereby made a part hereof except that plaintiff excludes from Parcel 5, Government lot 11 in Section 12 and the lands between ordinary high and ordinary low water fronting said lot.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its left bank which lies between the line of ordinary low water and the line of ordinary high water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforesaid described real property from the plaintiff.

V

The reasonable value for the use of said premises for each year of the six years immediately prior to the

filing of the original Complaint in this action is, to-wit: $5,000. The reasonable value for the use of said premises for each year during the pendency of this action is, to-wit: $5,000.

FOR AN EIGHTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 6 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor and which parcel is more particularly described by the legal description set forth in Exhibit "H" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its left bank which lies between the line of ordinary low and the line of ordinary high water.

IV

Defendant does now wrongfully withhold the pos-

session of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforedescribed real property from the plaintiff.

V

The reasonable value for the use of said premises for each year of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $3,303.39. The reasonable value for the use of said premises for each year during the pendency of this action following the filing of this First Amended Complaint is, to-wit: $3,303.39.

FOR A NINTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 7 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor and which parcel is more particularly described by the legal description set

forth in Exhibit "I" which is annexed hereto and thereby made a part hereof except that plaintiff excludes from Parcel 7 Government lot 11 in Section 12 and the lands between ordinary high and the ordinary low water fronting said lot.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its left bank which lies between the line of ordinary low water and the line of ordinary high water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of the original Complaint in this action has wrongfully and continuously withheld the aforedescribed real property from the plaintiff.

V

The reasonable value for the use of said premises for each year of the six years immediately prior to the filing of the original Complaint in this action is, to-wit: $2,000. The reasonable value for the use of said premises for each year during the pendency of this action is, to-wit: $2,000.

FOR A TENTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 8 on that certain map designated Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor which parcel is more particularly described by the legal description set forth in Exhibit "J" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its left bank which lies between the line of ordinary low water and the line of ordinary high water.

IV

Defendant does now wrongfully withhold the possession of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforedescribed real property from the plaintiff.

V

The reasonable value for the use of said premises for each year of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $3,000.

The reasonable value for the use of said premises for each year during the pendency of this action following the filing of this First Amended Complaint is, to-wit: $3,000.

FOR AN ELEVENTH, FURTHER AND SEPARATE CAUSE OF ACTION, PLAINTIFF ALLEGES:

I

Realleges paragraphs I and II of plaintiff's first cause of action.

II

By virtue of its sovereignty the plaintiff now is and at all times since its admission into the union of the United States has been the owner in fee simple of and entitled to the immediate possession of that parcel of real property which is designated as Parcel No. 9 on that certain map designated as Benton County Survey No. 4825 dated October 16, 1969 and filed on November 4, 1969 with the Benton County Surveyor which parcel is more particularly described by the legal description set forth in Exhibit "K" which is annexed hereto and thereby made a part hereof.

III

Said parcel lies wholly within that portion of the bed of the Willamette River on its right bank which lies between the line of ordinary low water and the line of ordinary high water.

IV

Defendant does now wrongfully withhold possession

of the aforedescribed real property from the plaintiff and for the six years immediately prior to the filing of this First Amended Complaint has wrongfully and continuously withheld the aforedescribed real property from the plaintiff.

V

The reasonable value for the use of said premises for each year of the six years immediately prior to the filing of this First Amended Complaint is, to-wit: $2,000. The reasonable value for the use of said premises for each year during the pendency of this action following the filing of this First Amended Complaint is, to-wit: $2,000.

WHEREFORE plaintiff prays for judgment granting the following relief:

Granting plaintiff the possession of the real property described in plaintiff's first cause of action and $25,000 damages for each year of the six years of the wrongful withholding of said property prior to the commencement of this action, plus $25,000 damages for each year during the pendency of this action that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $25,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's second cause of action and $6,356.38 damages for each year of the six years of the

wrongful withholding of said property prior to the filing of the wrongful withholding of said property prior to the filing of this First Amended Complaint plus $6,356.38 damages for each year during the pendency of this action following the filing of this First Amended Complaint that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $6,356.38 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's third cause of action and $1,589.10 damages for each year of the six years of the wrongful withholding of said property prior to the filing of this First Amended Complaint plus $1,589.10 damages for each year during the pendency of this action following the filing of this First Amended Complaint that defendant has withheld and withholds possesssion of said premises from the plaintiff, and interest on each $1,589.10 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's fourth cause of action and $1,035.03 damages for each year of the six years of the wrongful withholding of said property prior to the filing of this First Amended Complaint that defendant has withheld and withholds possession of said premises from

the plaintiff, and interest on each $1,035.03 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's fifth cause of action and $5,000 damages for each year of the six years of the wrongful withholding of said property prior to the commencement of this action, plus $5,000 damages for each year during the pendency of this action that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $5,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possehsion of the real property described in plaintiff's sixth cause of action and $15,000 damages for each year of the six years of the wrongful withholding of saia property prior to the filing of this First Amended Complaint, plus $15,000 damages for each year during the pendency of this action following the filing of this First Amended Complaint that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $15,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's seventh cause of action and $5,000 damages for each year of the six years of the wrongful withholding of said property prior to the commence-

ment of this action, plus $5,000 damages for each year during the pendency of this action that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $5,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's eighth cause of action and $3,303.39 damages for each year of the six years of the wrongful withholding of said property prior to the filing of this First Amended Complaint, plus $3,303.39 damages for each year during the pendency of this action following the filing of this First Amended Complaint that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $3,303.39 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's ninth cause of action and $2,000 damages for each year of the six years of the wrongful withholding of said property prior to the commencement of this action, plus $2,000 damages for each year during the pendency of this action that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $2,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's tenth cause of action and $3,000 damages for each year of the six years of the wrongful withholding of said property prior to the filing of this First Amended Complaint, plus $3,000 damages for each year during the pendency of this action following the filing of this First Amended Complaint that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $3,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid;

Granting plaintiff the possession of the real property described in plaintiff's eleventh cause of action and $2,000 damages for each year of the six years of the wrongful withholding of said property prior to the filing of this First Amended Complaint plus $2,000 damages for each year during the pendency of this action following the filing of this First Amended Complaint that defendant has withheld and withholds possession of said premises from the plaintiff, and interest on each $2,000 instalment at the rate of 6% per annum from the end of the year for which said instalment is payable until paid; and for plaintiff's costs and disbursements herein incurred.

LEE JOHNSON
Attorney General of Oregon
THOMAS D. O'DELL
Assistant Attorney General
PETER S. HERMAN
Assistant Attorney General

By PETER S. HERMAN
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Salem, Oregon 97310
Tel. 364-2171, ext. 1717

[Parcel descriptions, jurat and certificate of mailing omitted in printing]

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff, vs. CORVALLIS SAND AND GRAVEL COMPANY, Defendant.	)	No. 21512 DEMURRER

The defendant demurs as follows:

1. * * * * *.

2. To each cause of action separately on the ground each fails to state a cause of action.

Dated this 21st day of April, 1970.

/s/ ROBERT MIX
Attorney for defendant

[Certificate of mailing omitted in printing]

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff, vs. CORVALLIS SAND AND GRAVEL COMPANY, Defendant.	)	No. 21512 ORDER OVERRULING DEMURRER

The above-entitled matter having come on regularly for hearing on May 8, 1970, on the demurrer of the defendant to the first amended complaint; the plaintiff appearing through its attorney, Lee Johnson, by Philip J. Engelgau, defendant appearing through its attorney, Robert Mix; the Court having heard the arguments of the parties and being fully advised, now therefore

IT IS HEREBY ORDERED that the demurrer of the defendant be and the same is hereby overruled and the defendant shall have ten days from the date of signing of this order within which to answer the first amended complaint.

DATED this 27th day of May, 1970.

/s/ RICHARD MENGLER
Judge

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff,
vs.
CORVALLIS SAND AND GRAVEL COMPANY, an Oregon Corporation, Defendant.

No. 21512
THIRD AMENDED ANSWER

Defendant, for Third Amended Answer to plaintiff's First Amended Complaint, pleads as follows:

FOR ANSWER TO PLAINTIFF'S FIRST CAUSE OF ACTION:

I

Admits I.

II

Denies II, III and IV, and each and every allegation therein contained.

III

Answering V, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering VI, defendant denies that the alleged reasonable annual value of the use of the said premises is $25,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S SECOND CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $2,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S THIRD CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $1,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S FOURTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $1,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S FIFTH CAUSE OF ACTION:

I

Admits I of I and IV.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering V, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering VI, defendant denies that the alleged reasonable annual value of the use of the said premises is $1,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S SIXTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $15,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S SEVENTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $5,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S EIGHTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $2,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S NINTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $2,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S TENTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $3,000 or any other amount.

FOR ANSWER TO PLAINTIFF'S ELEVENTH CAUSE OF ACTION:

I

Admits I of I.

II

Denies II of I, II and III and each and every allegation therein contained.

III

Answering IV, defendant admits that it has withheld possession of the said real property as alleged, but denies that such action is or has been wrongful.

IV

Answering V, defendant denies that the alleged reasonable annual value of the use of the said premises is $2,000 or any other amount.

BY WAY OF FIRST AFFIRMATIVE DEFENSE DEFENDANT PLEADS AS FOLLOWS:

[Omitted]

BY WAY OF SECOND AFFIRMATIVE DEFENSE DEFENDANT PLEADS AS FOLLOWS:

By way of separate defense to each of plaintiff's causes of action, defendant alleges the following:

I

Defendant is the owner in fee simple of the property described in defendant's amended Complaint, except that defendant does not own that portion leased by plaintiff to defendant and does not own parcel Number One hereinafter described which is owned by the City of Corvallis, an Oregon municipal corporation or parcel Number Two which is owned by Winfred Brown and Loretha Brown, husband and wife.

[Parcel description omitted]

WHEREFORE, defendant demands that plaintiff take nothing by its First Amended Complaint, that the same be dismissed, and that the defendant recover its costs and disbursements herein.

/s/ ROBERT MIX
of Attorneys for Defendant

[Jurat, certificate of mailing and verification omitted in printing]

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff,	)	
vs.	)	No. 21512
CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation,	)	REPLY
Defendant.	)	

Comes now plaintiff, STATE OF OREGON, Acting by and through the State Land Board, and replies to defendants Third Amended Answer, as follows:

For Reply to Defendant's First Affirmative Defense:

[Omitted in printing]

For Reply to Defendant's Second Affirmative Defense.

I

Plaintiff denies that defendant is the owner in fee of any portion of the parcels of real property described in plaintiff's Amended Complaint.

II

With regard to parcel NUMBER ONE and parcel NUMBER TWO, as described in defendant's Second Affirmative Defense, plaintiff admits defendant's allegation that the defendant does not own the same. Plaintiff further admits that defendant does not own that certain real property leased by plaintiff to defendant,

being described in paragraph IV of the fifth cause of action of plaintiff's Amended Complaint, page 6, as Parcel 3.

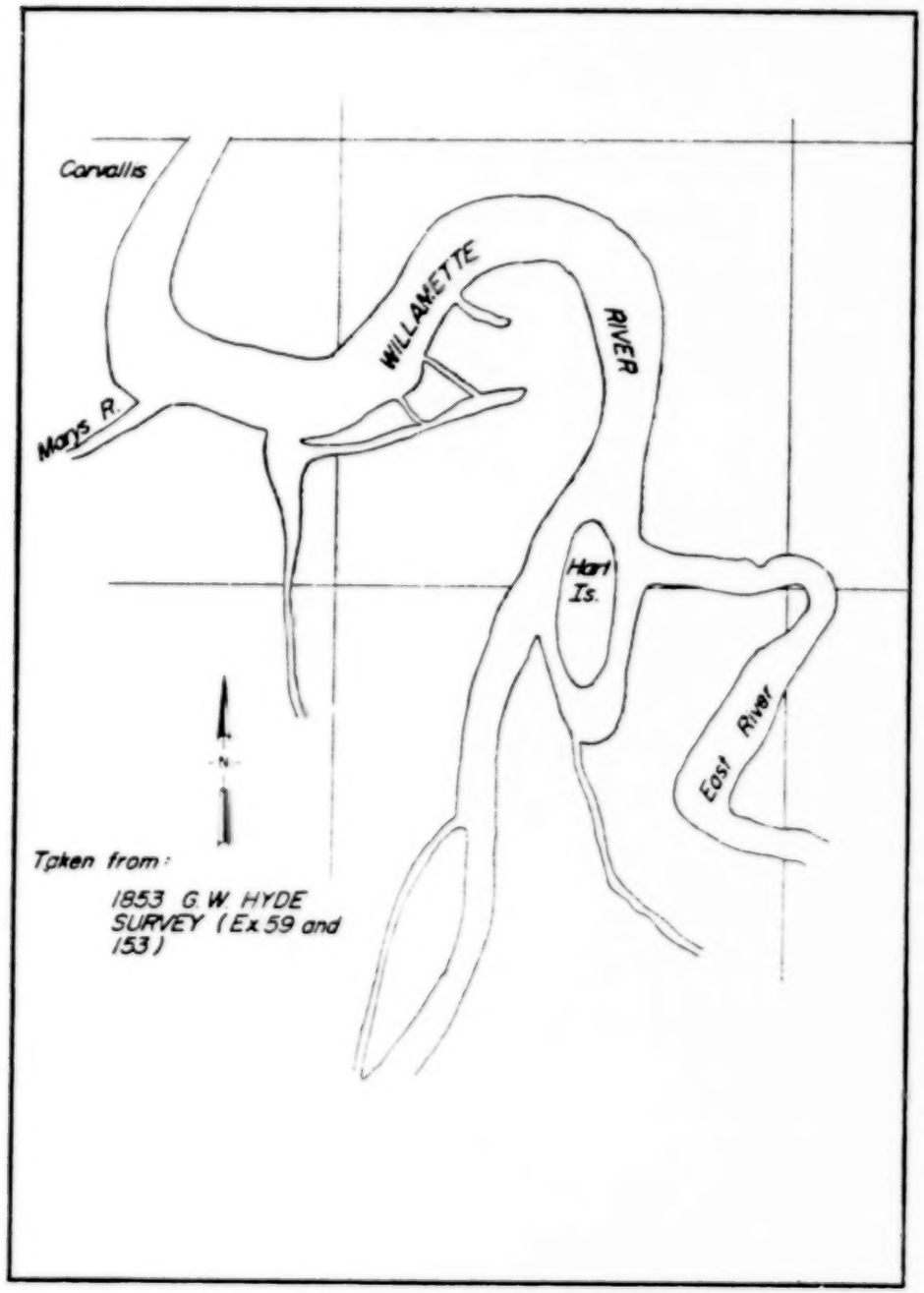
Wherefore, having replied to defendant's Third Amended Answer, plaintiff demands judgment against the defendant as prayed for in its Amended Complaint.

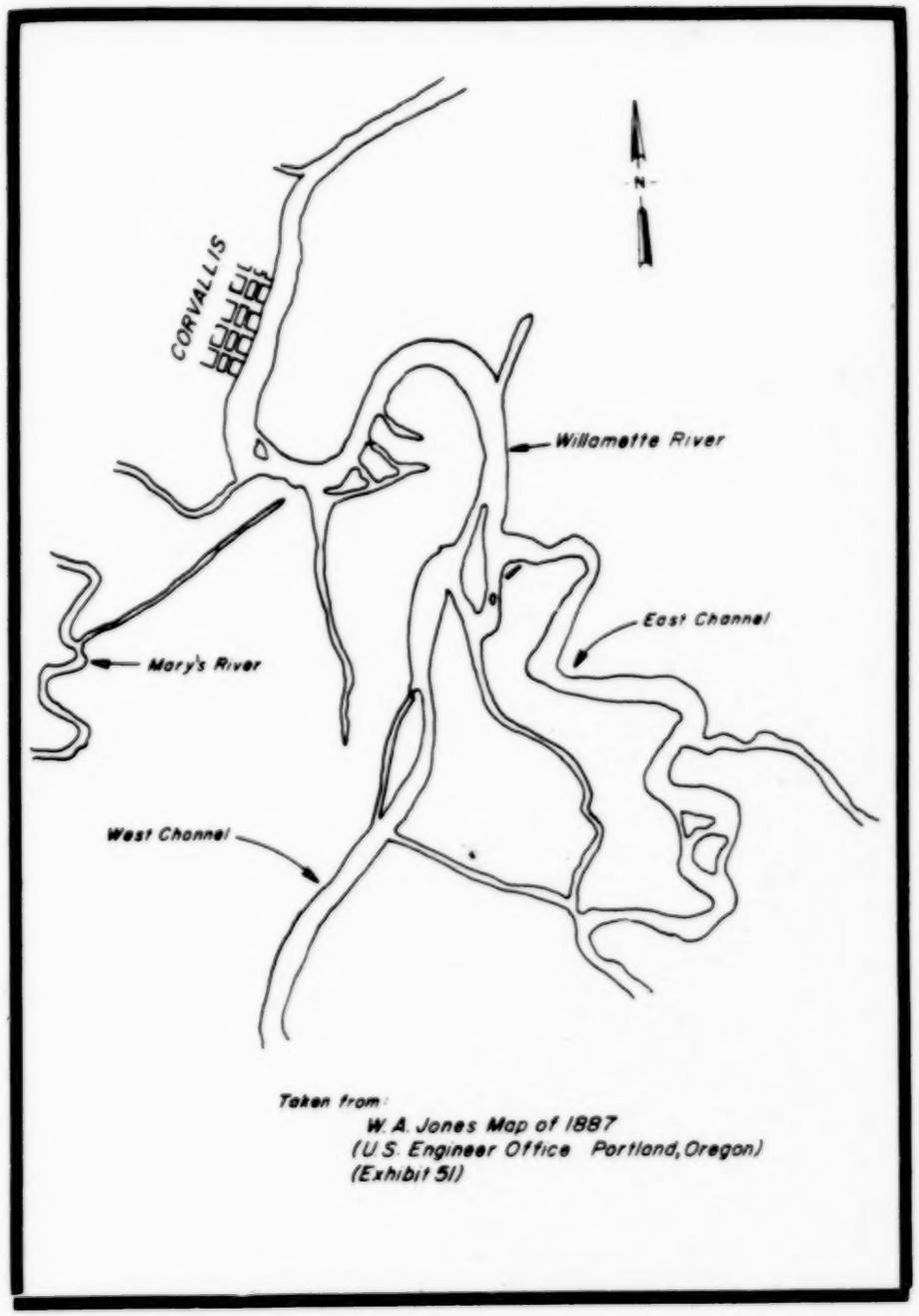
LEE JOHNSON
Attorney General

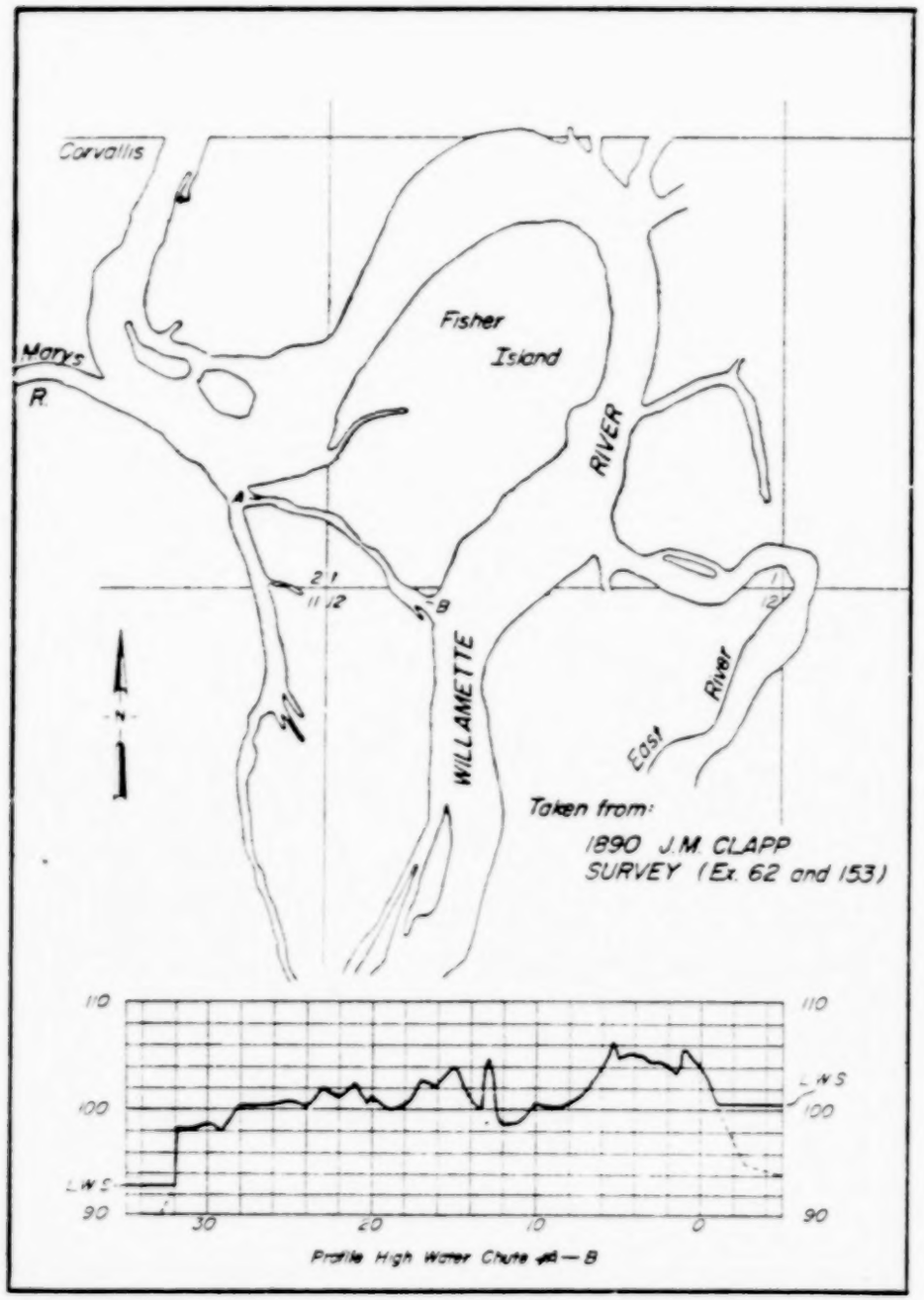
PETER S. HERMAN
Senior Counsel

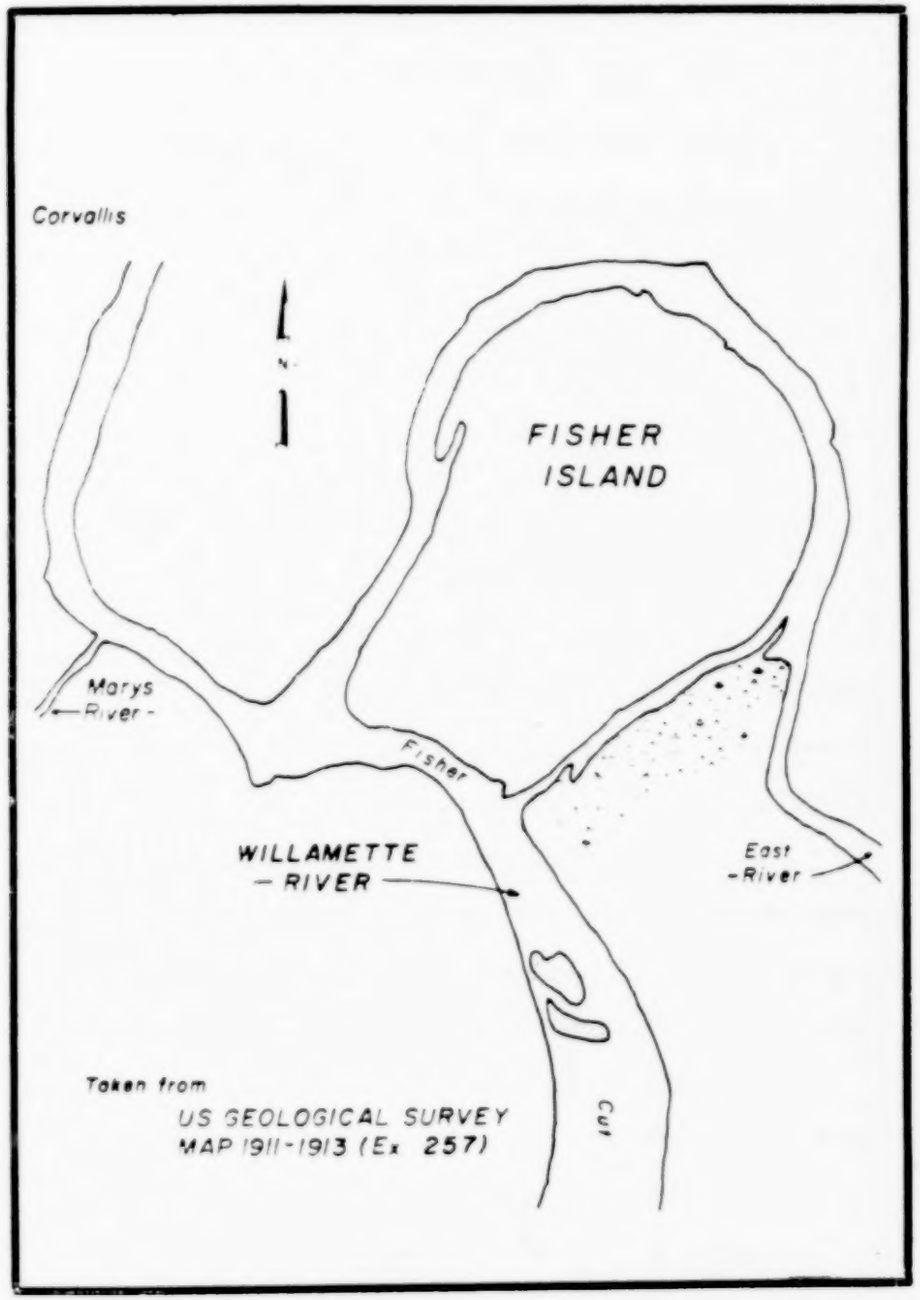
/s/ PHILIP J. ENGELGAU
Assistant Attorney General

[Jurat, verification and certificate of service omitted in printing]


Corvallis
WILLAMETTE
RIVER
Mary's R.
Hart
Is.
East River
N
Taken from:
1853 G.W. HYDE
SURVEY (Ex. 59 and
153)


CORVALLIS
Willamette River
East Channel
Mary's River
West Channel
N
Taken from:
W. A. Jones Map of 1887
(U.S. Engineer Office Portland, Oregon)
(Exhibit 51)


Corvallis
Marys R.
Fisher Island
RIVER
WILLAMETTE
East River
Taken from:
1890 J.M. CLAPP SURVEY (Ex. 62 and 153)
110
100
90
L.W.S.
30
20
10
0
Profile High Water Chute #A—B


Corvallis
FISHER ISLAND
Marys River
Fisher
WILLAMETTE RIVER
East River
Taken from
US GEOLOGICAL SURVEY
MAP 1911-1913 (Ex 257)

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, by and through the State Land Board, Plaintiff,	)	
v.	)	No. 21512
CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation, Defendant.	)	

PARTIAL TRANSCRIPT—TESTIMONY OF FRED S. FISCHER

[389]

FRED S. FISCHER, being called as a witness, was first duly sworn according to law, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Herman:

Q Can you hear me all right, Mr. Fischer?

A Yes, I'm all right.

Q Would you state your full name for the record, please?

A Huh?

Q Would you state your full name for the record?

A Huh?

Q State your name.

A Oh, Fred S. Fischer.

Q And you reside here in Corvallis?

A Born here, yes.

Q When were you born, Mr. Fischer?

A December 29, 1881.

Q And you have lived here all your life?

A Yes, practically all my—a little time I was at college away from town, but this is my home. I was in Portland for probably six or seven months, went to business college there.

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Q Mr. Fischer, I'm going to have you handed Exhibit 15 which is an aerial photograph.

A Yes, this is Seavy hop yard and this is the Crystal Lake.

Q That's correct.

A And cemetery is here and hop dryers are here, that's right, and the gravel bunkers is at the mouth of this cut and our flour mill was right here.

Q You are pointing where the arrow is and right next to the word "mill," that was the Fischer flour mill?

A Yes, that was the Fischer flour mill and Marys River come in there, doesn't it?

Q That's correct.

A And our home was right—right about there, that's where I was born.

Q Right near to the mill?

A Yes, just—

Q Do you recognize this over there across the river?

A Oh, yes, yes.

Q Fischer Island?

A Fischer Island, yes. That should be a "C" in there but then it's S-C-H, it's German.

Q All right. Now, Mr. Fischer, did you used to play in the area of Fischer Island when you were a boy?

A Yes, yeah, all the young fellows, oh, around 12, 13, 14 years, we used to hunt in there for rabbits.

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Q I see.

A And my brother used to shoot China pheasants over there too because I was too young to use a gun at that time.

Q All right. Did the river used to go around Fischer Island?

A No.

Q How did the river used to go?

A Well, now let's see. This is the new channel, huh?

Q Yes.

A And this is—what is this here?

Q I think that is the old East River.

A East River, and what—you want to know now is where it broke through?

Q That's right, I am interested in this gully I

think you described in your deposition.

A Uh-huh.

Q Some weeks ago.

A Yes. And this here is about, oh, I would judge two and a half to three miles around there.

Q You are talking about Fischer Island?

A Yes, and this here cut here is probably three-quarters of a mile, half to three-quarters of a mile.

Q Is that what you call Fischer Cut?

A Yes, I call that the Fischer Cut and then that draw was right in through here.

Q Do we have—

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A It was—

Q —a crayon, Mr. McReary? Do you want to mark where the draw was, Mr. Fischer?

A Well, if I can locate myself now, this is—what is that?

Q Well, that is an island in 1932—or 1936, Mr. Fischer.

A Oh.

Q That is upstream from Fischer Island, of course.

A Yeah, well now, let's see. Was this Marys River—no.

Q No, that's where the East River meets the Willamette River, the Marys River is down here.

A Oh, I see. This is the East River?

Q That's correct.

A East River, and you want to know—

Q The approximate location of this cut or gully.

A It would be right in through there.

Q Do you want to make a series of crosses?

A Well, now let's see if I understand it right. What does this white represent?

Q Well, I think that's gravel.

A Gravel.

Q Or silt, Mr. Fischer.

A Uh-huh.

Q Remember, this is a 1936 photograph.

A Uh-huh. Well, it would be right in through there, it

[393]

extended and this area is what?

Q Well, that is just part, that is just upstream, Mr. Fischer.

A Uh-huh. Well, this is all dry land now, isn't it?

Q Yes.

A Yeah. Well let's see now, and you want to know where—

Q Well, let's stop there a minute, Mr. Fischer. You have marked three crosses, did you used to play in that area as a boy?

A Yes.

Q What was it, was it a gully?

A Yes, probably 25 feet wide and probably five or six—maybe, oh, seven—between six and eight feet deep.

Q I see.

A Just like that.

Q When would there be water in this gully?

A During the winter rainy season.

Q Would there be any water there in the summertime?

A In certain places where it washed out more, you see, that soil was just sandy soil and it washed down every high water.

Q There was sandy soil in the gully?

A Well, down—well, I'd say the hard pan was the bottom of it, but above that was sandy soil, it washed, the floods washed all the sandy soil out.

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Q Was there a gully there as long as you can remember?

A Oh, yes, as I told you once before, the Lord Almighty made it.

Q So it was there when you were a boy?

A Oh yes, yes.

Q How old do you think you were when you remember it there as a boy?

A Oh, probably eight-nine years old.

Q I see.

A Whenever Mother let me go.

Q I see. Now, you say there was water through that area in the wintertime?

A Oh, yes.

Q What about in the spring?

A The whole island sometimes was covered.

Q Was it overflowed?

A With the extreme high water.

Q I see. Did this gully enlarge during the years?

A Oh, yes it kept going in all the time now.

Q When you say it kept going in—

A Going, going east.

Q You mean moving toward Fischer Island?

A Yes, taking soil away from us.

Q I see.

A Probably as much as, oh, that area, I should judge we lost

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probably through that Fischer Cut probably 60 acres.

Q You mean the water eroded this away?

A Yeah, in time, oh, a period of five years anyway.

Q I see.

A Before it broke through and it kept gradually —gradually and finally the steamboat used to go around here.

Q Around Fischer Island?

A Yes. Now, the Hogue Creek, where is that,

that is up in here, isn't it?

Q Maybe you can point it out, Bob.

MR. MIX: Yes, Mr. Fischer, this is where Hogue Creek comes into the Willamette right here, sir.

A Yeah, yeah. Is Kiger Island over here?

Q This is Kiger Island and this is Booneville up in here.

A Yeah, we had a warehouse at Booneville years and years ago, that was about, oh, about '99, I should say, the Benton Mill, we bought the Benton Mill from the Avery and Gibson Company.

Q I see.

A There was competition between my father and them.

Q I see.

A So he finally bought the town mill, what I call the town mill, and put me in charge in there about 1903 and I was there until the highway bought the First Street property.

Q I see. Mr. Fischer—excuse me.

[396]

A Yes, all right.

Q Was there any water in this Fischer Cut during lower stages of the river?

A Very little, just in places where there was washed out a little more than ever.

Q I see.

A And let's see, they—the boys used to haul gravel, those fellows are all gone now, Lamerson and all that bunch with teams, you see, they hauled gravel and had to go through this cut or this draw and it was quite a pull when they had a yard of gravel or sand up this hill, and then there was another big hill right in here at the end of where Gallagher's land ends now.

Q I see. Was the upstream end of the gully higher than the downstream?

A Oh, certainly, certainly, it wouldn't flow if it didn't, yes, it was just a gradual—gradual grade through there, you see.

Q And it was a gradual process that the river eroded away this gully then finally broke through?

A Well, I think the gravel mostly come from up in here.

Q Gradual process, I said?

A Yes, that's right, and it filled in and filled in and finally we had—well, let's see, the gravel bunkers would be this way, wouldn't it. We have had what we call

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a dead-man over in here for the anchor for the cable that we drawed the gravel from here up into the bunkers.

Q You mean where East River meets the Willamette you hauled gravel across the river or dug it?

A No, this isn't East River, this is the river that comes around Fischer Island.

Q Fischer Island?

A Yeah, that's right, and that's the gravel, the dead-man would be just about—about there.

Q Why don't you put a "D" there, Mr. Fischer?

A All right. Our home would be about there where I was born.

MR. MIX: Yes, that's by the mill, wasn't it, Mr. Fischer?

WITNESS: Just this side of the mill.

MR. MIX: Yes.

WITNESS: In fact, we had a long storage place reach pert near to the house, but in years back it was, oh, that warehouse was probably a hundred feet long and two stories and we stored the flour and mill feed in there.

MR. MIX: I see.

WITNESS: And then they had doors at different places where the trucks could load or mostly wagons then.

Q Do you know when the river finally broke through,

[398]

Mr. Fischer, and you mentioned to me yesterday that your brother sold the gravel bunkers and I think it was in—

A 1909.

Q 1909?

A Yeah, and Gallagher, you see, he started it in about 1909, then he sold to Gallagher in about '11.

Q I see. Had the river broken all the way through by then?

A By the time—oh, yes, that's the reason he built the bunkers because all that gravel from up in here.

Q From upstream?

A Yes, just kept—the winter floods would carry that gravel just like that. (Waving hands)

Q Carrying it into Fischer Cut?

A Through the Fischer Cut, yes.

Q I see.

MR. HERMAN: I think that's all, Your Honor, on direct.

CROSS-EXAMINATION

By Mr. Mix:

Q Mr. Fischer, did your father own the land?

A Yeah.

Q Where the draw was?

A We bought that. There was a family by the name of

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Corthalver, they come from Illinois the same place that my father did. They come earlier and they bought this farm, let's see now, where would that be, you have the gravel bunkers

—right in through here, they bought that, that was what we call the Corthalver place and my father bought that in about 19—, oh, in the '90's, I should say.

Q Now, after the river broke through it was flowing over land that had been your father's farm, is that correct?

A Oh, yes, it took about 60 acres through here.

Q Now, when you were a boy, did you used to run cattle in the summertime over to the island across the draw?

A My dad had a hundred cow dairy and we used that for pasture and I was a kid, I had a pony and it was my job to herd these cattle up to it, there was a gate right about there, right at the cemetery hill, and we took them up to the barn and had the boys milk them and we had a milk route here in town at one time also.

Q Uh-huh. Mr. Fischer, would you like to finish marking where the draw was before the river broke through, you started to make some X's?

A I want to know—

Q When it broke through?

A If I can get started here, what does this represent?

Q That is the river, Mr. Fischer, and this is a bar, a gravel bar in the river.

[400]

A And the river used to go through here?

Q Something like that, yes.

A Uh-huh.

Q About—excuse me.

A And then what you want to know is how long that gully was—

Q Yes, you said about—

A Well, right to the head of where it broke through, of course.

Q I see. I think that's fine.

A About there.

Q I see. I think that's fine.

A And about there, I imagine.

Q All right.

MR. HERMAN: You added two more crosses, Mr. Fischer, I'm just pointing that out.

WITNESS: Well, that's what I—and there was eventually there was a big pile of gravel right at the head of this, this old river.

MR. HERMAN: Yes.

WITNESS: That went around and all that gravel come from in here through the current, the winter floods. Can you think of anything else?

Q I'm just trying to think, Mr. Fischer, just give me a minute.

[401]

A All right. Take your time. Are you getting

along all right? (Referring to court reporter)

Q Is it correct, Mr. Fischer, that after 1906 you ran the warehouse down on First Street?

A What, I didn't get that?

Q After 1906 did you run the warehouse down at First and Van Buren by the bridge?

A After, oh yes, before that.

Q And—

A I graduated up here at the college in '03 and then they put me down there, my brother August run the home plant and they bought this here, what we call the Benton Mill, that is the mill about a block this side of the Van Buren Street Bridge and they put me in charge there, and then I had another brother that we owned a mill in Silverton, Oregon and he was down there.

Q And where did you live while you were running the warehouse?

A Well, I was married in '15.

Q I see.

A And then I moved to where I live now, we built that house, I lived on Fifth Street for about a year and a half or two years while we were building the home that I live in at the present time which, as it's marked on the sidewalk, when we went in there in 1917, that is when the house—that is when the house was finished and we moved in there.

[402]

Q You didn't live out at the mill property after, say 1900 or so, is that correct?

A After 1900?

Q (Nodding head affirmably)

A Well, I lived there until I was married.

Q At the mill?

A At this house.

Q Oh, I see.

A At what we call Mother's home.

Q Just a moment.

MR. HERMAN: Does the reporter get that all right.

Q Was there a wagon road across over to the island?

A In the early days, yes.

Q All right.

A Then as I told you, there was the cemetery that was quite a grade from the river bottom to the mainland and they had to pull that up and then through the draw, it was, as I said, it was about eight feet deep, six to eight feet deep, they had—it was quite a pull for those old horses with a yard of gravel to come up that.

Q You didn't see the actual breakthrough, did you?

A Oh no, no. I was in Illinois, I took my mother back to Illinois in, let's see, in '15. I had an uncle that was very sick and my mother's brother, and they

called for her and she was getting pretty well along in age so they asked

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me if I would go and I was gone about, oh, five or six months and about that time this cut went through, this was about, oh, let's see now, let's see. I have it down here, about 19—, yeah, my brother started the bunkers in '09 and Gallagher bought it in '11 and I should say it took about five years for this break to come through from the main mouth of what would be called mouth of Hogue Creek.

Q I see. And that breakthrough, did I understand you to say it was around 1909 when your brother was operating the gravel business?

A Before that, he built that about 1909.

Q And the breakthrough had already taken place?

A Oh, yes, about five years, because it was—this is the reason there was so much gravel come down there and they put a dead-man there and put the bunkers across and drawed the gravel through here to the old—to the present bunkers.

Q I see.

A Of course, the bunkers have been remodeled a good deal since our time since he put it, enlarged, and then the railroad, see, Carver built a — where's the mainland — where does the Southern Pacific

cross the Marys River?

Q That isn't shown on there, Mr. Fischer.

A It doesn't show?

Q No, that isn't on that photograph.

[404]

A Well, anyhow—

Q Do you know, did anyone try to clear this gully out of trees or logs or anything?

A No.

Q To your knowledge?

A Just natural winter floods.

Q Did it — all right.

A And the soil was so sandy that it just, the current just washed it. On the Seavy side over here there was a lot of trees through here and naturally they wouldn't—the current wouldn't, the trees' roots held the bank, but over on our side it was just sandy soil.

Q I see.

A In fact, the matter is, years ago people in town here, they bought little tracts in there and had gardens which is now all in here, all gone.

Q All in where the river took it out?

A Yeah, the river washed it out.

Q I see.

MR. MIX: I think we have nothing further.

WITNESS: All right.

MR. HERMAN: Thank you very much, Mr.

Fischer.

MR. MIX: Thank you. Thank you very much.

WITNESS: Am I through for the day?

MR. MIX: Yes.

[405]

MR. HERMAN: You are through for the day.

WITNESS: Maybe I might be called again?

MR. HERMAN: I don't think so, Mr. Fischer.

WITNESS: Well, someone said it would take a couple days to finish the trial.

MR. HERMAN: I don't think we'll be calling you again.

WITNESS: All right. Thank you very much.

MR. HERMAN: Thank you, sir.

WITNESS: I'm 90 years old.

MR. HERMAN: Mr. McReary, you can resume the stand.

* * * * *

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, by and through the State Land Board,

Plaintiff,

v.

CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation,

Defendant.

No. 21512

PARTIAL TRANSCRIPT—TESTIMONY OF DOUGLAS HASTIE

[861]

MR. MIX: All right. Mr. Hastie here? Mr. Hastie, would you come forward, please? We will call Mr. Douglas Hastie, Your Honor.

MR. DOUGLAS HASTIE, being called as a witness, was first duly sworn according to law, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Mix:

Q Will you state your name, please?

A Pardon?

Q Will you state your name, please?

[862]

A Douglas G. Hastie.

Q And, Mr. Hastie, for the record, when were you born, please?

A Where?

Q When.

A In Canada.

Q And what year?

A Eighteen ninety-four.

Q All right. And when did you first come to Corvallis?

A In 1908.

Q Nineteen hundred and eight, and I direct your attention to Thanksgiving Day of 1908, where were you living at that time?

A It was 1909, I think is the year that we were discussing.

Q All right, 1909.

A Yes, I was living down north of Corvallis on the old McFadden place.

Q That would be down in the general area of the sewage treatment plant?

A Just beyond the Dixie Creek where it flows into the Willamette.

MR. HERMAN: Which creek?

MR. MIX: Dixon Creek, it's called popularly Dixie Creek.

Q And will you tell us what happened on that day, please,

[863]

Mr. Hastie?

A Well, we had — you mean about the high water?

Q Yes.

A We had about two or three days of it, but it came up awfully quick and at that particular low place it raised about 18 inches an hour and we were marooned on an island below, couldn't get to town, that is the whole valley was full of water there.

Q Do you recall any of the things that happened to stock and so on?

A Yes, there was a slaughterhouse right there and a lot of the stock got drowned in the slaughterhouse and some swam clear over to the 6th Street railroad track and got out, I remember that.

Q Do you remember how fast the water rose that time?

A Eighteen inches an hour they stated.

THE CLERK: Defendant's Exhibit 232 and 233 marked for identification.

Q All right. If you will just hold them, please. Now, do you associate this with Thanksgiving Day of 1909, is that correct?

A Yes, that's right.

Q All right. I'll ask the Court to take judicial notice of the fact that I have a universal calendar, if I read this properly, the Thanksgiving Day fell on the last

[864]

Thursday in 1909 and that was the 25th of November, and I will submit this to the Court if it wishes to make an examination, and the purpose of this is, we are going to tie this into a particular flood that occurred on that date, Your Honor.

MR. HERMAN: I would like to see it.

THE COURT: Show it to Mr. Herman.

MR. HERMAN: All right. Who prepared this, Mr. Mix?

MR. MIX: I honestly think that came out of the telephone book, a universal calendar we keep in my office.

THE COURT: Well, in any event, his testimony is the last Thursday of November of 1909, we can start from there and then if you—

MR. HERMAN: I have no way of knowing whether this is valid or not, Your Honor.

THE COURT: Well, that I don't—I don't probably either, but I will take judicial notice as best I can.

Q Now, Mr. Hastie, was there anything that occurred in connection with the channel of the river that was, shall we say, discussed in the community at that time?

A I wasn't familiar with it up there that particular time.

Q But did you hear—

A Only what I have heard say, yes.

[865]

Q What did you hear, please?

A I heard—

MR. HERMAN: Just a minute, please.

MR. MIX: Excuse me.

MR. HERMAN: Your Honor, this is hearsay and I would like to know the purpose of the offer.

MR. MIX: Well, yes, Your Honor, common knowledge of historical events by someone who was in the community at the time is admissible and the purpose of this is to show that Mr. Hastie heard in the town, it was a matter of common knowledge that the river broke through the Fischer Cut area at that time.

MR. HERMAN: Well, I don't know as we laid a sufficient foundation to do that.

THE COURT: Well, I'm going to let him testify whatever it is he thinks he knows about what happened in 1909 and I will overrule whatever objection you have, Mr. Herman.

Q All right. Mr. Hastie, was there any discussion in the community at that time, and I am talking about Thanksgiving of 1909, about the Willamette River channel changing?

A Not that I remember of, no, not too much. I can't remember it.

Q Well, I direct you particularly to the Fischer Island

[866]

area, was there any discussions about the channel changing in that area?

A I don't remember too much that there was much said about it, only what—just what I had from friends, you know, I heard.

Q What did you hear, please?

A Well, in—

MR. HERMAN: Well, Your Honor, that definitely is hearsay.

THE COURT: Well, you may have a continuing objection. I will hear what he has to say.

MR. HERMAN: I submit this is not common reputation, if that's what it's being offered for.

THE COURT: I understand.

Q What did you hear, please, Mr. Hastie?

A A friend of mine told me that he could step across the creek there in 1907, that was before I came here.

Q Yes.

A And in 1909 he said the water broke through and made the river there.

Q And we're talking about the area called Fischer Cut, is that correct?

A Yes, that is right.

Q And this is the area where the Corvallis Sand

and Gravel Company operates?

[867]

A Yes, that's right.

Q All right. Sir, now do you know where it broke through?

A Not in particular. I have been by there, but I didn't—I can't say that I viewed the place very observing, where it broke through.

* * * * *

[878]

* * * * *

Q Mr. Hastie, had you actually observed the area called Fischer Cut or is this just something you heard about?

[879]

A Up there at the bar?

Q No, I'm talking about Fischer Cut now.

A Oh, yes. I hauled wood across there after it broke through, after the river broke through.

Q I see.

A They put a ferry in there just across from the Corvallis Sand and Gravel plant, now over there they put a ferry in, the ferry only had to run about as far as across this room and we got out on the bar there, but I have been familiar with the area all my life since I have been here most—

Q What date was this when you were hauling wood across the cut?

A Well, I don't remember quite what year it was, 1911 or '12, along in there somewheres. I don't remember just the exact year.

MR. HERMAN: No further questions.

MR. MIX: We have nothing further, Your Honor.

THE COURT: You may step down.

MR. MIX: Thank you, Mr. Hastie. Thank you very much.

WITNESS: Thank you.

THE COURT: I think we will have about a 15-minute recess before we go any further.

(A recess was taken)

[880]

MR. HERMAN: Your Honor, could we recall Mr. Hastie for a couple brief questions?

THE COURT: You may.

MR. HERMAN: Could we have those photographs?

THE COURT: Here they are.

(Mr. Hastie was previously sworn)

CROSS-EXAMINATION

By Mr. Herman:

* * * * *

Q All right. Now, turning again to Fischer Cut, how wide was the channel when you were ferrying logs across?

A Wood?

Q Yeah.

A I would say it wasn't over fifty feet.

Q Was the river still going around also the old East Channel?

A Oh yes. The old channel they called it then, yeah, that was running quite a lot.

Q This was at the time you were running logs across Fischer

[881]

Cut?

MR. MEAD: Wood.

Q Wood.

A Yes, uh-huh.

MR. HERMAN: No further questions.

MR. MIX: We have no questions, Your Honor.

THE COURT: All right. That's all. You may step down.

MR. MIX: Thank you, Mr. Hastie.

WITNESS: Thank you.

STATE EXHIBIT 71

U. S. DEPARTMENT OF COMMERCE

Asheville, North Carolina

July

I HEREBY CERTIFY that the annexed is a true copy of selected pages from the official publication entitled Daily River Stages containing data for Willamette River, Albany, Oregon for the period January 1, 1900 through December 31, 1969

e in the National Climatic Center, Asheville, North Carolina.

CLYDE M. COLLIER

Archivist

[authentication certificate omitted in printing]

DESCRIPTION OF RIVER GAGES, ETC.

Columbia River System—Willamette River, Albany, Oreg.

1900

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.5	5.6	8.4	10.2	4.0	3.3	2.4	1.4	0.7	0.7	10.0	6.4
2	6.6	5.5	7.5	9.0	3.9	3.2	2.3	1.4	0.7	0.8	9.5	7.0
3	7.2	5.5	7.5	8.4	3.8	3.0	2.1	1.4	0.7	0.8	8.5	6.5
4	8.5	5.5	7.4	7.8	3.7	3.0	2.0	1.4	0.7	0.8	7.9	6.0
5	6.6	5.5	7.3	5.4	3.7	2.9	1.9	1.3	0.7	0.9	7.6	5.5
6	6.5	5.2	7.0	5.0	3.8	2.9	1.9	1.3	0.7	0.9	5.3	5.0
7	6.6	5.2	6.5	5.5	3.8	2.8	1.9	1.3	0.7	0.9	5.4	4.5
8	6.7	5.2	8.4	6.0	4.0	2.7	1.8	1.2	0.8	0.9	4.5	4.0
9	6.8	5.5	9.8	6.5	4.0	2.6	1.8	1.2	0.9	1.0	4.3	3.0
10	7.0	6.6	10.5	6.0	4.1	2.5	1.8	1.2	0.9	1.0	3.7	3.5
11	7.0	6.4	9.2	6.2	4.0	2.4	1.8	1.1	0.9	1.0	3.5	3.5
12	8.5	6.2	8.0	5.9	3.8	2.3	1.7	1.1	0.9	1.0	3.2	3.2
13	13.6	6.0	7.5	5.8	3.8	2.2	1.7	1.1	1.0	1.0	3.0	3.5
14	18.2	6.3	7.3	6.0	3.8	2.3	1.6	1.0	1.0	1.0	2.9	3.8
15	24.0	6.0	6.6	6.4	3.7	2.4	1.6	0.9	1.0	1.0	2.7	4.0
16	22.5	5.7	6.3	6.8	3.7	2.5	1.5	0.9	1.0	1.0	2.6	5.0
17	17.3	5.5	6.0	5.7	4.2	2.5	1.5	0.9	1.0	1.0	2.5	5.5
18	16.5	5.3	6.2	5.5	4.0	2.5	1.5	0.9	1.0	1.0	2.7	7.4
19	15.5	5.2	6.4	4.8	3.8	2.5	1.5	0.9	1.0	1.4	3.0	6.5
20	12.9	5.5	5.2	4.5	3.6	2.5	1.5	0.8	0.9	1.9	3.5	6.5
21	10.8	6.9	6.6	4.5	3.5	2.5	1.5	0.8	0.9	2.3	3.0	9.8
22	9.6	12.0	5.9	4.4	3.5	2.5	1.5	0.8	0.9	3.0	3.0	15.8
23	8.5	16.7	5.4	4.2	3.3	2.5	1.5	0.8	0.9	3.4	3.0	18.5
24	8.5	16.0	5.4	4.2	3.3	2.5	1.5	0.8	0.8	4.0	3.0	14.8
25	8.2	12.0	5.4	4.1	3.0	2.5	1.5	0.7	0.8	3.8	4.1	11.5
26	7.9	10.4	6.0	4.0	3.5	2.4	1.5	0.7	0.8	3.5	5.2	10.5
27	7.4	10.4	6.5	4.0	4.0	2.3	1.5	0.7	0.7	3.6	8.8	9.5
28	6.0	9.0	6.4	4.0	4.3	2.2	1.4	0.7	0.7	3.7	8.4	8.0
29	6.5	.....	6.6	4.0	4.0	2.1	1.4	0.7	0.6	3.5	6.4	7.5
30	6.2	.....	8.4	4.0	3.5	2.0	1.4	0.7	0.6	4.4	6.0	7.0
31	5.9	.....	11.5	.....	3.5	.....	1.4	0.7	.....	4.6	.....	6.4
Means.	10.0	7.4	7.2	5.6	3.8	2.6	1.7	1.0	0.8	1.9	4.9	7.1

DESCRIPTION OF RIVER GAGES, ETC.

Columbia River System—Willamette River, Albany, Oreg.—Continued

1901

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.0	5.3	14.0	7.0	4.2	4.0	1.9	1.3	0.8	2.2	2.0	5.0
2	7.2	5.0	12.5	6.4	4.2	3.2	1.9	1.2	0.8	1.5	2.0	7.6
3	7.5	4.7	11.5	8.0	4.3	3.5	1.9	1.1	0.8	1.5	2.0	12.4
4	8.2	4.5	10.5	7.6	4.4	3.5	1.9	1.0	0.8	1.5	2.0	12.9
5	7.5	4.3	8.5	7.5	4.4	3.5	1.9	1.0	0.8	1.5	1.8	13.4
6	7.2	4.1	8.0	8.2	4.3	3.4	1.9	0.9	0.8	1.5	1.7	12.5
7	6.0	4.0	7.5	8.7	4.3	3.4	1.9	0.9	0.8	1.5	1.5	11.4
8	7.5	3.8	7.4	9.2	4.3	3.3	1.9	0.9	0.8	1.5	1.4	11.0
9	7.5	3.6	7.5	8.4	4.4	3.2	1.8	0.9	0.8	1.4	1.5	10.5
10	7.0	3.4	7.7	7.5	4.4	3.1	1.8	0.8	0.9	1.3	10.5	15.5
11	6.5	3.2	7.9	7.3	4.7	3.0	1.8	0.8	0.9	1.2	1.5	18.4
12	7.9	3.2	8.0	7.3	4.9	3.0	1.8	0.8	0.9	1.1	1.2	13.5
13	13.6	3.4	7.7	7.0	5.0	3.0	1.8	0.8	0.9	1.0	1.1	10.0
14	20.9	5.0	7.0	6.8	5.0	3.0	1.7	0.8	0.9	1.0	1.0	8.1
15	30.4	7.5	6.2	6.5	5.0	2.9	1.7	0.8	1.0	1.0	1.3	7.0
16	28.4	11.0	6.5	6.1	4.9	2.8	1.6	0.8	1.0	1.0	1.4	6.2
17	23.0	17.4	6.5	5.8	4.9	2.7	1.6	0.8	1.0	1.0	1.8	5.5
18	15.8	26.0	6.4	5.7	5.0	2.6	1.5	0.8	1.0	1.0	1.2	5.3
19	12.2	19.6	6.0	5.5	5.0	2.5	1.5	0.8	1.0	1.0	1.2	5.1
20	10.5	14.0	5.5	5.3	5.1	2.5	1.5	0.8	1.0	1.0	1.5	4.9
21	9.4	14.5	5.1	5.6	5.0	2.5	1.5	0.8	1.1	1.0	1.5	4.5
22	8.5	13.5	5.3	5.9	5.0	2.5	1.4	0.8	1.2	1.0	2.0	4.3
23	8.3	11.4	5.5	4.7	4.9	2.4	1.4	0.8	1.7	1.0	3.5	3.9
24	8.5	11.7	5.7	4.7	4.8	2.3	1.4	0.8	1.8	1.0	9.4	4.0
25	8.1	12.0	5.9	4.3	4.7	2.2	1.4	0.8	1.8	1.0	8.5	4.1
26	7.5	12.4	8.4	4.5	4.6	2.1	1.3	0.8	2.0	1.0	6.5	4.2
27	7.0	12.4	10.4	4.5	4.5	2.0	1.3	0.8	2.2	1.0	5.5	4.2
28	6.5	13.6	10.0	4.2	4.5	2.0	1.3	0.8	2.6	1.0	4.4	4.4
29	6.2	.....	8.9	4.0	4.5	2.0	1.3	0.8	2.5	1.4	3.9	4.5
30	6.0	.....	8.0	4.0	4.3	1.9	1.3	0.8	2.4	1.7	3.8	4.6
31	5.6	.....	7.5	.....	4.0	.....	1.3	0.8	.....	2.0	.....	4.7
Means.	10.4	9.1	7.9	6.3	4.6	2.8	1.6	0.9	1.2	1.3	2.7	7.9

DESCRIPTION OF RIVER GAGES, ETC.

Columbia River System—Willamette River, Albany, Oreg.—Continued

1902

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	3.9	13.4	5.4	4.5	5.6	2.5	1.5	0.8	1.0	1.0	7.3
2	4.2	3.1	11.5	5.5	5.4	5.6	2.5	1.5	0.8	1.0	1.0	11.5
3	4.2	3.3	10.3	5.6	6.0	5.5	2.7	1.5	0.8	1.0	1.5	12.9
4	4.4	3.5	9.4	5.5	5.9	5.5	4.0	1.5	0.8	0.8	2.4	12.5
5	4.5	4.0	10.6	5.6	5.5	5.5	6.0	1.5	0.8	0.8	2.0	17.2
6	4.6	5.4	11.0	5.8	5.4	5.3	6.2	1.4	0.8	0.8	1.7	24.5
7	6.4	6.6	10.1	6.0	5.8	5.0	5.5	1.4	0.8	0.8	2.4	20.3
8	9.2	8.5	9.5	9.1	5.9	4.8	4.5	1.4	0.8	0.8	3.1	14.5
9	10.2	10.3	8.7	12.2	6.0	4.6	4.2	1.4	0.8	0.8	5.4	15.8
10	8.0	12.4	8.1	11.5	6.0	4.6	3.7	1.4	0.8	0.8	7.6	17.4
11	7.9	17.0	7.5	10.0	6.1	4.5	3.5	1.3	0.8	0.8	6.0	19.4
12	7.0	16.2	7.3	9.4	6.2	4.0	3.9	1.3	0.8	0.8	5.9	16.0
13	6.5	14.5	7.4	8.5	5.8	4.0	4.3	1.3	0.8	0.9	5.9	13.3
14	5.8	12.4	7.5	7.9	5.9	3.8	4.7	1.3	0.8	0.9	4.9	11.7
15	5.5	10.4	7.5	7.1	6.0	3.7	4.7	1.3	0.8	1.0	5.5	10.0
16	4.7	9.9	7.5	7.0	6.4	3.5	4.6	1.3	0.8	1.0	6.4	8.8
17	4.5	9.5	7.5	7.4	6.2	3.5	4.5	1.2	0.8	1.0	7.5	7.7
18	4.5	9.3	7.5	7.7	6.8	3.4	4.3	1.2	0.8	1.0	11.7	6.9
19	4.4	9.6	8.5	8.0	7.5	3.3	4.2	1.2	0.8	1.0	13.1	6.2
20	4.2	9.7	8.5	8.3	8.0	3.2	4.0	1.2	0.8	1.0	14.0	5.6
21	4.1	8.3	8.4	8.0	8.0	3.1	3.8	1.2	0.9	1.0	10.5	6.0
22	4.0	7.9	8.4	7.5	7.9	3.0	3.8	1.2	0.9	1.0	8.8	6.6
23	3.8	7.5	8.2	7.0	7.7	3.0	3.6	1.1	1.0	1.0	7.5	7.0
24	3.7	7.0	8.0	6.3	7.4	2.9	3.4	1.1	1.0	1.0	6.2	7.9
25	3.5	7.5	7.4	6.0	6.8	2.8	3.2	1.1	1.0	1.0	5.5	8.8
26	3.3	9.4	7.2	5.8	6.2	2.7	2.8	1.1	1.0	1.0	5.1	8.9
27	3.1	12.0	7.0	5.3	6.2	2.6	2.5	1.1	1.0	1.0	4.8	9.3
28	3.0	13.0	6.5	4.8	6.4	2.5	2.2	1.0	1.0	1.0	4.9	8.7
29	2.9	.....	6.2	4.5	6.4	2.5	1.9	1.0	1.0	1.0	5.0	8.0
30	2.8	.....	6.3	4.5	6.0	2.5	1.6	1.0	1.0	1.0	5.2	7.4
31	2.8	.....	6.5	.....	5.6	.....	1.5	1.0	.....	1.0	.....	7.0
Means.	4.9	9.0	8.4	7.1	6.3	3.9	3.7	1.3	0.9	0.9	5.8	11.1

DESCRIPTION OF RIVER GAGES, ETC.

Columbia River System—Willamette River, Albany, Oreg.—Continued

1903

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.1	13.9	5.4	6.0	4.0	4.6	2.5	1.4	1.1	1.0	1.0	6.2
2	9.5	11.8	5.1	5.7	4.2	4.7	2.4	1.4	1.3	1.0	1.2	5.9
3	11.0	9.5	4.9	5.3	4.3	4.5	2.4	1.3	1.4	1.0	1.5	5.5
4	10.5	8.3	4.7	4.9	4.4	4.2	2.4	1.3	1.5	1.0	1.5	5.1
5	10.0	7.5	4.5	4.7	4.5	3.9	2.3	1.3	1.6	1.3	1.6	5.8
6	9.0	7.0	4.5	4.5	4.5	3.6	2.3	1.3	1.7	1.7	1.7	5.6
7	8.2	6.4	4.5	4.5	4.6	3.6	2.2	1.3	1.8	3.1	2.6	4.5
8	7.5	6.9	4.5	4.7	4.5	3.6	2.2	1.3	1.9	3.0	4.0	4.3
9	6.9	7.3	4.5	5.2	4.3	3.8	2.2	1.3	1.9	2.5	3.9	4.0
10	6.0	7.6	4.6	5.0	4.3	3.9	2.1	1.3	2.0	2.1	3.8	3.8
11	5.8	10.8	4.8	4.9	4.3	3.8	2.1	1.2	2.1	2.0	5.7	3.6
12	5.5	11.4	7.4	4.6	4.4	3.8	2.0	1.2	2.3	2.0	9.1	3.6
13	5.0	10.0	10.0	4.4	4.4	3.7	1.9	1.2	2.4	1.9	12.4	3.7
14	4.8	9.3	8.5	4.4	4.4	3.5	1.9	1.2	2.5	1.8	9.3	3.7
15	4.7	7.9	8.5	4.0	4.5	3.2	1.9	1.1	2.3	1.7	12.2	3.9
16	4.5	6.5	8.5	3.8	4.5	3.2	1.9	1.1	2.0	1.6	12.5	4.1
17	4.3	6.0	7.4	3.7	4.5	3.2	1.9	1.1	1.6	1.6	9.9	5.8
18	4.1	5.8	6.6	3.6	4.6	3.1	1.9	1.1	1.5	1.5	8.4	5.8
19	3.9	5.6	5.8	3.5	4.5	3.0	1.8	1.0	1.4	1.4	6.9	5.8
20	4.3	5.4	5.4	3.4	4.3	2.8	1.7	1.0	1.3	1.4	6.9	5.7
21	5.0	5.2	4.9	3.3	4.2	2.7	1.7	1.0	1.2	1.3	8.7	5.6
22	11.5	6.0	4.7	3.7	4.0	2.6	1.6	1.0	1.2	1.2	11.6	5.5
23	17.5	6.6	4.5	4.0	3.9	2.6	1.6	1.2	1.2	1.2	14.5	5.4
24	18.4	6.3	4.5	4.2	3.8	2.6	1.5	1.4	1.2	1.2	13.8	5.2
25	21.8	6.5	4.6	4.3	3.7	2.5	1.5	1.6	1.1	1.1	13.4	5.0
26	31.3	6.3	4.8	4.4	3.7	2.5	1.4	1.4	1.1	1.1	10.0	4.9
27	27.0	6.0	4.8	4.5	3.7	2.4	1.4	1.5	1.0	1.0	8.7	4.8
28	20.8	5.8	4.9	4.5	4.0	2.5	1.4	1.3	1.0	1.0	8.0	4.6
29	15.6	.....	5.7	4.5	4.1	2.6	1.4	1.2	1.0	1.0	7.2	4.4
30	13.8	.....	6.6	4.2	4.3	2.6	1.4	1.1	1.0	1.0	6.6	4.3
31	14.1	.....	6.3	.....	4.4	.....	1.4	1.0	.....	1.0	.....	4.2
Means.	10.7	7.6	5.7	4.4	4.3	3.3	1.9	1.2	1.6	1.5	7.3	4.8

DESCRIPTION OF RIVER GAGES, ETC.

Columbia River System—Willamette River, Albany, Oreg.—Continued

1904	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.2	5.2	14.9	11.2	8.0	4.8	2.5	1.6	1.0	0.9	0.9	2.5
2	4.2	5.2	16.2	9.5	7.6	4.8	2.4	1.6	1.0	0.9	1.0	2.2
3	4.2	5.1	16.4	9.4	7.3	4.8	2.4	1.5	1.0	0.9	1.0	2.6
4	4.3	5.0	14.8	9.3	7.0	4.7	2.3	1.5	1.0	0.9	1.0	2.4
5	4.3	4.9	17.0	8.9	6.6	4.6	2.3	1.5	1.0	0.9	1.0	2.2
6	4.3	5.5	15.3	8.6	6.4	4.5	2.2	1.4	1.0	0.9	1.0	2.0
7	4.4	6.0	13.3	8.5	6.2	4.4	2.1	1.4	1.0	0.9	1.2	1.9
8	4.4	6.5	15.5	8.5	6.0	4.2	2.1	1.4	1.0	0.9	1.2	1.9
9	4.5	6.5	18.6	8.2	5.8	4.0	2.1	1.4	1.0	0.9	1.1	1.8
10	7.5	6.5	21.0	8.8	5.8	3.9	2.0	1.3	1.0	0.9	1.1	2.0
11	10.5	7.5	16.9	9.4	5.8	3.8	2.0	1.3	1.0	1.1	1.0	2.8
12	15.6	11.0	13.6	10.2	5.8	3.7	2.0	1.3	1.0	1.6	1.0	3.9
13	14.0	13.0	12.9	11.1	5.8	3.6	2.0	1.3	1.0	1.9	1.0	5.2
14	12.0	11.8	12.2	11.5	5.8	3.5	2.0	1.3	1.0	1.6	1.0	8.0
15	10.5	13.8	13.1	11.0	5.7	3.5	2.0	1.2	1.0	1.2	1.2	8.9
16	11.5	19.8	13.8	9.9	5.7	3.4	2.1	1.2	1.0	1.4	1.3	9.6
17	11.0	-24.5	12.0	8.8	5.7	3.3	2.2	1.2	1.0	1.6	1.6	8.0
18	10.9	21.0	11.8	7.9	5.7	3.2	2.2	1.2	1.0	2.2	2.0	6.7
19	10.6	14.0	11.9	7.5	6.0	3.1	2.1	1.2	1.0	1.8	2.4	6.8
20	10.3	11.5	12.2	7.4	6.4	3.0	2.0	1.2	1.0	1.7	2.5	6.0
21	9.0	10.7	12.5	7.3	6.0	2.9	2.0	1.2	1.0	1.6	2.5	5.0
22	9.2	10.8	12.0	7.2	6.0	2.8	2.0	1.2	1.0	1.4	3.0	4.8
23	9.0	14.8	11.5	7.0	5.8	2.8	2.0	1.1	1.0	1.3	2.8	4.7
24	8.8	16.9	10.6	6.6	5.6	2.8	1.9	1.1	1.0	1.2	3.2	5.3
25	8.6	16.3	9.7	6.2	5.4	2.7	1.8	1.1	1.0	1.1	2.6	6.4
26	8.5	15.0	9.6	6.6	5.2	2.7	1.8	1.1	1.0	1.0	2.6	7.5
27	7.5	15.5	9.5	7.0	5.1	2.6	1.8	1.1	1.0	1.0	2.5	6.4
28	6.4	16.7	9.5	7.3	5.0	2.6	1.8	1.1	1.0	1.0	2.4	5.7
29	5.6	15.2	10.8	7.5	4.9	2.5	1.7	1.1	1.0	0.9	2.4	6.3
30	5.4	.....	13.4	7.7	4.8	2.5	1.7	1.1	1.0	0.9	2.5	11.0
31	5.2	.....	12.8	.....	4.8	.....	1.6	1.1	.....	0.9	.....	16.8
Means.	7.9	11.6	13.4	8.5	5.9	3.5	2.0	1.3	1.0	1.2	1.7	5.4

-24.7 at 1 p.m.

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ALBANY, OREGON

Albany, Oreg. Established January 1, 1892. Is on the Willamette River, 118 miles from its mouth, and 34 miles above Salem, Oreg. The width of the river at average low water is 300 feet. The drainage area above the station is 4,980 square miles.

The river gage is located at the north end of Bradablin street and is in two sections. The first section (0 to 19 feet) is attached to one of the piers of the dock of Westgage Brothers. The second section (19 to 35 feet) is attached to the warehouse of Westgage Brothers and 30 feet nearer the shore line than the first section. Both sections are made of 2 by 8 inch Oregon fir, and are painted white, with graduations cut into the wood and painted black.

B.M., U.S.G.S., 124 feet north of Southern Pacific railroad track, is 40.8 feet above zero of the gage and 212 feet above mean sea level.

Graduation extends from zero to 35 feet above. Highest water was 36 feet, on December 8, 1861; lowest, 0.2 foot, on September 21, 1879. Flood stage is at 20 feet.

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DESCRIPTION OF RIVER GAGES, ETC.
COLUMBIA RIVER SYSTEM—WILLAMETTE RIVER
ALBANY, OREG.

1907

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0	15.3	5.8	5.7	4.0	3.0	2.0	1.1	0.9	0.9	1.1	4.6
2	6.5	16.4	6.7	5.6	3.8	3.0	2.0	1.1	0.9	1.0	1.0	4.0
3	6.8	17.8	6.3	5.6	3.7	2.9	2.0	1.1	0.8	1.1	0.9	3.6
4	14.2	20.4	5.8	5.6	3.6	2.9	2.2	1.1	0.8	1.1	1.3	3.3
5	22.2	22.5	5.6	5.2	3.5	2.8	2.0	1.0	0.8	1.0	1.2	3.2
6	25.0	30.7	5.2	5.6	3.5	2.8	2.0	1.0	0.8	1.0	1.1	3.3
7	17.0	28.2	5.0	10.4	3.4	2.7	2.0	1.0	0.8	0.9	0.9	3.2
8	11.5	23.3	5.0	19.8	3.4	2.7	2.0	1.0	0.8	0.9	0.9	3.2
9	9.2	17.0	5.0	20.0	3.4	2.7	1.8	1.6	0.8	0.8	0.8	4.0
10	7.9	13.0	4.8	16.5	3.4	2.7	1.7	1.5	0.8	0.7	0.8	3.9
11	7.0	11.0	5.6	13.5	3.5	2.6	1.6	1.3	0.8	0.7	0.8	4.4
12	6.3	9.9	5.4	11.8	4.0	2.6	1.6	1.2	0.8	0.7	0.7	5.3
13	6.0	8.8	5.0	10.4	3.9	3.3	1.5	1.1	0.8	0.7	0.7	7.5
14	5.6	8.1	5.0	9.0	3.7	3.3	1.5	1.0	0.7	0.7	0.8	11.4
15	5.0	7.5	4.6	8.8	3.6	3.2	1.5	1.0	0.7	0.7	0.9	12.0
16	4.6	7.0	4.4	8.0	3.4	3.1	1.5	1.0	0.8	0.7	1.4	9.4
17	4.2	6.6	4.3	7.0	3.3	3.1	1.5	1.0	0.8	0.7	1.4	7.5
18	4.0	6.4	5.2	6.6	3.4	3.0	1.4	0.9	0.9	0.7	1.2	6.5
19	4.0	5.8	9.1	6.5	3.5	2.9	1.4	0.9	1.0	0.7	1.0	6.0
20	4.0	5.5	10.0	6.4	3.8	2.7	1.4	0.9	0.9	0.7	1.2	6.2
21	4.0	5.2	11.0	6.4	4.0	2.6	1.4	0.8	0.9	0.7	1.8	7.0
22	4.0	5.0	9.8	6.3	3.8	2.5	1.3	0.8	0.8	0.7	3.5	10.3
23	3.9	5.0	8.7	6.0	3.6	2.4	1.3	0.8	0.7	0.6	3.2	17.0
24	3.9	5.0	8.5	5.8	3.6	2.3	1.3	0.8	0.7	0.6	5.0	22.5
25	3.9	5.0	8.0	5.6	3.4	2.3	1.3	0.8	0.7	0.6	7.5	20.8
26	4.6	5.0	7.5	5.4	3.3	2.3	1.2	0.8	0.7	0.6	10.5	23.4
27	5.0	6.5	6.9	5.2	3.2	2.2	1.2	1.0	0.7	0.6	8.3	26.2
28	5.6	6.0	6.2	4.8	3.1	2.1	1.2	1.0	0.7	0.6	6.9	26.5
29	7.7	.....	5.9	5.4	3.0	2.1	1.2	1.0	0.7	0.6	6.0	20.6
30	12.0	.....	5.8	4.2	3.0	2.1	1.1	0.9	0.7	0.7	5.1	14.8
31	14.2	.....	5.7	.....	3.0	.....	1.1	0.9	.....	1.0	.....	11.6
Mean.	8.0	11.6	6.4	8.1	3.5	2.7	1.6	1.0	0.8	0.8	2.6	10.1

DESCRIPTION OF RIVER GAGES, ETC.
COLUMBIA RIVER SYSTEM—WILLAMETTE RIVER—Continued
ALBANY, OREG.

1908

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.5	4.0	4.2	5.4	4.4	3.7	3.0	1.5	1.3	0.7	3.1	3.1
2	10.3	3.9	4.5	5.4	4.5	3.6	3.0	1.5	1.3	0.7	3.2	2.9
3	9.6	3.7	4.5	5.3	4.5	3.6	3.0	1.5	1.0	0.8	2.8	2.8
4	8.7	3.6	4.4	5.3	4.5	3.6	2.9	1.5	1.0	0.8	2.6	2.6
5	8.2	4.0	4.2	5.3	4.4	3.6	2.8	1.5	1.0	0.8	2.4	2.4
6	7.0	5.4	4.1	5.0	4.3	3.6	2.7	1.5	1.0	0.8	2.2	2.2
7	7.4	6.5	4.0	4.7	4.1	3.5	2.6	1.5	0.9	0.8	2.0	2.1
8	6.9	7.8	4.0	4.5	4.4	3.5	2.5	1.4	1.0	0.8	1.9	2.1
9	7.5	7.2	3.8	4.2	4.6	3.5	2.4	1.3	1.0	0.8	1.8	2.1
10	10.0	7.1	3.6	4.1	4.5	3.5	2.3	1.2	1.0	0.8	1.7	2.1
11	9.9	6.5	3.6	4.1	4.2	3.5	2.2	1.2	1.0	0.8	1.6	2.0
12	8.8	6.1	3.6	4.0	4.1	3.6	2.1	1.1	1.0	0.8	1.5	2.0
13	8.0	5.8	3.6	4.3	4.0	3.7	2.0	1.1	1.0	0.8	1.5	2.1
14	7.6	5.6	3.8	4.2	3.9	3.8	2.0	1.1	0.9	1.0	1.5	2.7
15	7.5	5.2	5.4	4.4	3.8	3.7	2.0	1.1	0.9	2.6	1.4	3.0
16	7.5	4.9	10.3	4.3	4.3	3.6	2.0	1.1	0.9	6.5	1.4	2.9
17	7.0	5.0	13.3	4.4	5.3	3.5	2.0	1.1	0.9	5.1	1.4	2.8
18	6.4	5.2	13.8	4.5	5.5	3.4	1.9	1.0	0.9	3.8	1.4	2.6
19	6.0	5.0	11.8	4.9	5.9	3.4	1.9	1.0	0.9	3.0	1.6	2.4
20	6.3	4.7	9.4	5.0	6.6	3.4	1.8	1.0	0.9	2.6	2.5	2.2
21	8.3	4.4	8.0	5.2	6.7	3.5	1.8	1.0	0.8	2.6	3.0	2.1
22	8.2	4.2	7.0	5.2	6.1	4.5	1.7	1.0	0.8	2.5	5.8	2.0
23	7.3	4.0	6.3	4.9	5.6	5.0	1.7	1.0	0.8	3.0	6.0	2.2
24	6.8	4.0	5.8	4.6	5.1	4.5	1.7	1.0	0.8	3.0	6.8	3.9
25	6.1	3.8	5.5	6.0	4.8	4.0	1.6	1.0	0.8	2.5	6.5	5.8
26	5.5	3.7	5.4	6.6	4.5	3.7	1.6	1.0	0.8	2.4	5.7	5.4
27	5.3	3.6	5.3	5.9	4.2	3.6	1.6	1.0	0.8	2.3	5.0	7.6
28	4.8	3.9	5.2	5.3	4.2	3.6	1.5	1.0	0.7	2.2	4.4	7.4
29	4.4	4.1	5.1	4.9	4.1	3.4	1.5	1.0	0.7	2.2	4.0	7.3
30	4.4	.....	4.9	4.6	3.9	3.1	1.5	1.3	0.7	2.1	3.5	8.8
31	4.2	.....	4.8	.....	3.8	.....	1.5	1.4	.....	2.1	.....	7.2
Mean.	7.3	4.9	5.9	4.9	4.7	3.7	2.1	1.2	0.9	2.0	3.0	3.5

DESCRIPTION OF RIVER GAGES, ETC.

COLUMBIA RIVER SYSTEM—WILLAMETTE RIVER—Continued

ALBANY, OREG.

1909

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.0	6.0	10.6	4.2	3.4	5.3	1.9	1.2	0.9	1.3	1.8	12.0
2	5.3	5.7	10.4	4.6	3.3	5.3	1.8	1.2	0.9	1.4	4.6	11.7
3	5.0	6.3	10.7	5.0	3.3	5.3	1.8	1.1	0.9	1.3	4.0	10.0
4	5.4	7.1	10.4	4.8	3.6	4.9	1.8	1.1	0.8	1.2	4.1	8.5
5	8.8	7.2	10.0	4.6	4.1	4.6	1.8	1.1	0.8	1.1	3.4	7.5
6	10.5	7.2	9.7	4.5	4.0	4.3	1.8	1.1	0.8	1.0	3.0	7.0
7	12.7	7.2	8.4	4.4	3.8	3.9	2.4	1.1	0.8	1.0	3.0	6.5
8	14.2	7.0	7.6	4.2	3.5	3.8	3.2	1.1	0.8	1.5	3.1	7.0
9	15.3	6.6	7.2	4.0	3.3	3.4	2.8	1.1	0.8	1.1	3.3	9.0
10	13.5	6.7	7.3	3.9	3.3	3.2	2.3	1.1	0.8	1.0	3.6	12.3
11	10.5	6.8	6.8	3.9	3.4	3.2	2.0	1.0	0.8	1.0	4.7	11.5
12	8.4	6.7	6.5	3.8	3.6	3.1	2.0	1.0	0.8	1.0	5.8	11.0
13	7.0	7.0	5.9	3.7	3.5	3.1	2.0	1.0	0.8	1.0	4.9	12.7
14	6.4	7.8	5.6	3.6	3.3	3.0	2.0	1.0	0.8	1.0	4.4	14.5
15	6.0	8.1	5.4	3.5	3.2	2.9	1.9	1.0	0.8	1.0	4.2	12.8
16	12.4	8.3	5.2	3.5	3.1	2.8	1.8	1.0	0.8	0.9	3.6	10.8
17	18.2	9.3	5.1	3.4	3.0	2.8	1.7	1.0	0.8	0.9	3.2	8.8
18	20.5	13.5	5.3	3.4	3.0	2.8	1.7	1.0	0.8	0.8	3.0	7.7
19	19.8	15.9	5.2	3.4	2.9	2.7	1.6	1.0	0.8	0.9	3.3	6.8
20	20.3	13.1	5.0	3.3	2.8	2.7	1.6	1.0	0.8	1.1	7.7	6.3
21	21.0	12.6	4.9	3.2	2.8	2.6	1.6	1.0	0.8	1.4	13.3	5.8
22	[1]23.4	12.1	4.7	3.2	2.8	2.4	1.6	1.0	0.8	1.7	14.3	5.3
23	23.3	10.5	4.5	3.0	2.8	2.4	1.5	1.0	0.8	1.7	16.3	4.9
24	18.5	9.2	4.2	3.0	2.7	2.3	1.5	1.0	0.8	1.7	28.5	4.6
25	13.5	10.3	4.1	3.0	2.6	2.2	1.5	1.0	0.8	1.5	[2]29.3	4.4
26	10.9	12.0	4.0	3.0	2.6	2.2	1.4	1.0	0.8	1.2	24.4	4.2
27	9.3	11.2	3.9	[illegible]	2.7	2.1	1.3	1.0	0.8	1.0	18.8	4.1
28	8.2	10.5	3.9	3.2	3.3	2.1	1.3	1.0	0.8	1.0	12.4	4.0
29	7.3	.....	4.0	3.8	4.1	2.0	1.3	0.9	0.8	1.0	11.0	3.8
30	6.6	.....	4.1	3.7	4.5	2.0	1.2	0.9	1.0	1.1	10.7	3.7
31	6.2	.....	4.2	.....	4.6	.....	1.2	0.9	.....	1.2	.....	4.2
Mean.	12.1	10.5	6.3	3.7	3.3	3.2	1.8	1.0	0.8	1.2	8.6	7.9

[1] 23.8 at 3 a.m.

[2] 31.0 at 3 p.m.

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DESCRIPTION OF RIVER GAGES, ETC.

COLUMBIA RIVER SYSTEM—WILLAMETTE RIVER—Continued

ALBANY, OREG.

1910

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	8.5	13.8	4.0	3.4	2.3	1.6	0.9	0.7	0.7	0.8	18.8
2	5.8	7.8	16.6	4.0	3.3	2.2	1.5	0.8	0.7	0.7	0.7	13.4
3	5.0	7.0	20.0	4.2	3.2	2.2	1.4	0.8	0.7	0.8	0.8	10.8
4	4.6	6.2	18.3	4.8	3.4	2.1	1.3	0.8	0.8	1.0	0.8	12.7
5	4.2	5.8	16.0	4.6	3.7	2.0	1.3	0.8	0.8	2.3	0.8	14.6
6	4.0	5.6	12.7	4.4	3.8	2.0	1.4	0.8	0.7	2.1	0.8	12.3
7	3.8	5.4	10.0	4.5	3.6	2.0	1.4	0.8	0.7	1.7	1.0	10.1
8	4.6	5.2	9.4	4.4	3.5	2.0	1.3	0.8	0.7	1.4	1.3	8.6
9	5.0	5.0	8.4	4.3	3.4	1.9	1.3	0.8	0.7	1.2	4.7	7.9
10	4.9	4.8	7.6	4.3	3.4	1.9	1.3	0.8	0.6	1.1	4.7	9.2
11	4.7	5.1	7.1	4.5	4.8	1.8	1.2	0.8	0.6	1.0	4.6	8.2
12	4.3	5.3	6.8	4.4	5.7	1.9	1.2	0.8	0.6	1.0	5.0	7.3
13	4.0	5.5	6.6	4.6	5.1	2.2	1.1	0.8	0.6	1.0	4.2	6.6
14	4.0	7.0	6.7	4.5	4.5	2.0	1.2	0.8	0.6	1.0	3.4	6.0
15	4.1	8.6	6.7	4.4	4.2	1.9	1.2	0.8	0.6	1.1	2.9	5.5
16	3.9	8.2	6.7	4.0	3.9	1.8	1.2	0.8	0.6	1.1	2.5	5.1
17	3.8	7.3	6.3	3.8	3.6	1.8	1.1	0.7	0.6	1.0	2.2	5.2
18	3.8	6.5	6.0	3.8	3.3	1.9	1.1	0.7	0.6	1.0	2.1	7.5
19	4.3	7.5	5.9	3.8	3.2	1.9	1.1	0.7	0.7	1.0	2.2	7.0
20	6.4	9.9	6.2	4.0	3.0	1.8	1.1	0.7	0.7	1.0	2.7	6.2
21	6.0	9.5	5.9	4.2	2.9	1.8	1.0	0.7	0.8	1.0	3.0	5.6
22	5.8	9.0	5.6	4.1	2.8	2.0	1.0	0.7	1.0	1.0	4.8	5.2
23	7.2	8.3	5.7	4.0	2.7	2.0	1.0	0.7	1.1	1.0	7.2	4.8
24	9.6	9.0	6.9	3.9	2.7	1.9	1.0	0.7	0.8	0.9	10.9	4.6
25	10.4	10.2	6.4	3.9	2.7	1.9	1.0	0.7	0.8	0.9	9.5	5.1
26	9.7	12.5	5.8	4.1	2.7	1.9	1.0	0.7	0.8	0.9	7.2	5.2
27	9.0	12.4	5.3	4.0	2.7	1.7	1.0	0.7	0.7	0.9	5.9	5.0
28	8.4	12.4	5.0	3.9	2.6	1.6	0.9	0.7	0.7	0.8	6.0	5.0
29	10.0	.....	4.7	3.7	2.6	1.6	0.9	0.7	0.7	0.8	12.3	4.8
30	10.2	.....	4.4	3.5	2.5	1.6	0.9	0.7	0.7	0.8	17.6	4.8
31	9.0	.....	4.2	.....	2.4	.....	0.9	0.7	.....	0.8	.....	5.4
Mean.	6.0	7.7	8.3	4.0	3.4	1.9	1.2	0.8	0.7	1.1	4.4	7.7

79

STATE EXHIBIT 90B

March 7, 1900

Brig. Gen. John M. Wilson
Chief of Engineers
U.S.A.
Washington, D.C.

General:

In compliance with 1st Indorsement (E D 34193) on letter of Hon. Thos. H. Tongue, M.C., dated Feb. 20, 1900, I have the honor to submit the following report relating to the revetment of bank of the Willamette River just above Corvallis, Oregon.

The necessity for this work to prevent a cut-off in the river has been recognized for many years and much money has been spent thereon. Should the cut-off occur it would be disastrous to the regimen of the river in the vicinity and to Corvallis, as the new channel would not pass the town.

The total length of bank revetted before the present work began was about 5,000 feet. Of this the upper 2,000 feet of revetment had been carried away, some portions had been revetted twice and the lower portion also gone. In addition to the revetment work proper a line of piles or posts had been put in approximately on the line shown on the accompanying sketch, for the purpose of catching drift at high water and by the piling up of this drift to form an obstruction to break the current across the point on the line of threatened cutoff. Unfortunately about the time a good body of drift had

collected, fire was set to it by accident or design and the whole accumulation, posts and all practically burned to the ground. So far as present evidence goes, it was doing good work in the direction desired.

For the present at least the loss of the upper portion of the revetment is not serious from the point of view of prevention of the cut off, though it may eventually become so as there is low ground in rear of the bank, but is regretable on account of the caving still going on and the consequent sediment thus thrown into the stream.

There are one or two localities in the old revetment still remaining which need repairs and strengthening, which, if money is available, but this is doubtful, it is proposed to do next summer during low water. The estimated cost of those repairs is approximaately $1,500.00.

The new work recently constructed and referred to in the letter of the Mayor of Corvallis, inclosed with Mr. Tongue's letter, commenced at the point "A" and thus replaces the lower portion of the old revetment that had disappeared. This new work then extends down stream some 1350 feet and is made as substantial and eminent as may be. This is some 860 feet longer than was projected when the work began. This extension in length I found necessary by personal inspection in order to attain any surety of obtaining the object sought. The lower end connects to relatively higher ground and thus the most dangerous portion of the low ground is

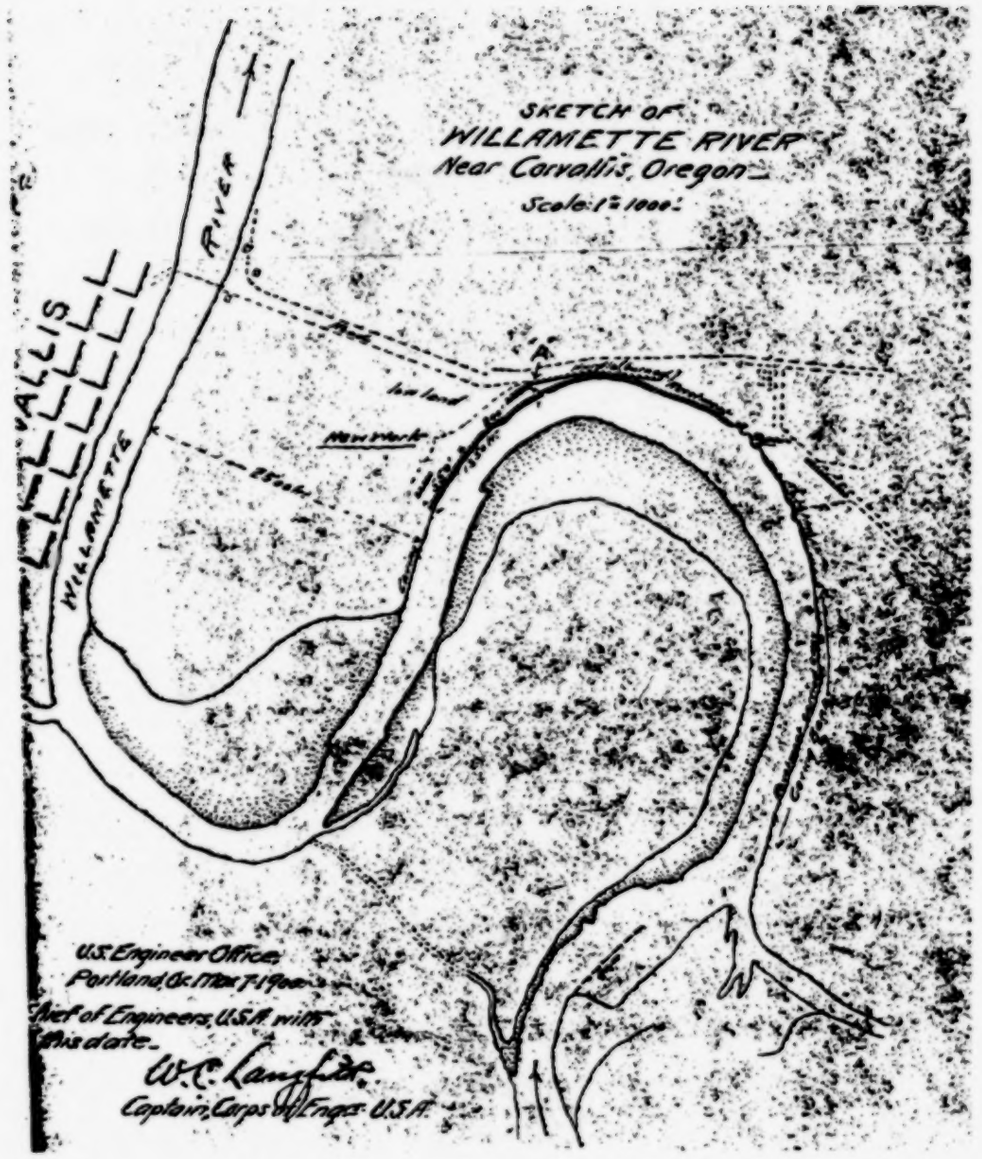
covered by it. This took more money than I should have liked to expend in the vicinity had it not seemed absolutely necessary. It is believed that present danger is averted, but the bank is caving for a distance of about 1000 feet below the lower end of the revetment and will have to be revetted ultimately. At the upper end of the old work the caving mentioned extends for about 800 feet, and this will also have to be done in time. In both cases of course the sooner it is done the better from all points of view. There is now no money available, as balance on hand is more than fully needed for absolutely necessary work elsewhere.

Under favorable circumstances, it is estimated that to revet the two stretches aggregating as shown 1800 feet, will cost, including engineering and contingencies, approximately $11,000.00. Adding the amount estimated for repairs, the total needed becomes $12,500.00.

It may be pertinent to add that from the point of view of the regimen of the river the work is worthy of being undertaken when funds are available. Every stretch of river where the banks are thus made stable and practically unerodable, promotes fixity of channel limits and renders work of improvement easier of design and execution. This is especially true of the Upper Willamette River whose banks are exceedingly variable.

Very respectfully,
Your obedient servant.

W. C. Langfitt
Captain, Corps of Engineers, U.S.A.



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STATE EXHIBIT 94A

UNITED STATES ENGINEER OFFICE

P.O. Drawer 50

Portland, Oregon

Sept. 1, 1891

REPORT

Examination and Survey of Willamette River, Oregon in vicinity Corvallis, 1890.

Major Thos. H. Handbury,
Corps of Engineers U.S.A.
Portland, Oregon.

Major:-

I have the honor to submit the following report, as a result of an examination and survey, of "The Willamette River," in the vicinity of Corvallis, Oregon, and made in December, 1890.

The object of this survey and examination, was to gain information relative to a cut-off that is threatened through the neck just in front of Corvallis; and to arrive at some conclusion as to the best method to prevent it.

The survey was an extended one and consisted of an examination and meander, of all the high water Sloughs and Outlets, and all the Forks and Channels of the River.

That portion of the River included in the survey, extends from a point one and a half miles North of Corvallis, South to a point six miles South of "Corvallis."

The weather was very favorable nearly all the time

the survey was going on, which was very extraordinary for that season of the year.

(2)

The water surface of the River was the lowest it had been for many years.

This was a great aid, enabling me to become well acquainted with the river bottom and its contracted Channel.

At that season and stage of the water, the river presented the appearance of an unnavigavible (sic) stream.

In the main river the Channel consisted of a series of deep pools, backed up or dammed by bars, having a depth of water varying from 18 inches to 30 inches. These bars as well as the bottom of the river throughout its course, are made up of hard flint like gravel, of a basaltic and volcanic composition, and range in size from a small pea to that of a cocoanut. Over the bars the water flows very rapidly and in almost every instance, especially the more shallow bars, forms into rapids, giving the river the appearance, not unlike that of a Mountain stream.

The course of the river is very winding; consisting of many crooks and bends, the latter being in many instances semi-circular in form.

The river in its normal state is contained between two banks, varying in elevation above the main low water surface, from 8 to 18 feet, and they vary in their distance apart from 200 to 600 feet. During the flood

season these banks are inundated by the rising water, and the river then is contained between two banks, averaging about 35 feet above the low water. The distance these higher banks are apart also varies from

2½ to 6 miles, the latter occuring immediately in front of the town of Corvallis.

The townsite of Corvallis, and in fact on the Corvallis or West side of the river, the land is high, but breaks almost precipitously to the river. On the East side and about 3½ miles South of Corvallis, the bank or bluff, is very similar and runs South enclosing the river at all stages. At this point 3½ miles South of Corvallis, the bluff bears away to the East rapidly; almost at right angles, to its direction for several miles and was not followed up owing to its distance from the river and the pressure of time making it of home (sic) value to confine my work in the vicinity of the river; which was of more importance during the favorable weather.

This river has a very peculiar course and has been subject to many changes during the last fourteen years.

It consists at present of two branches, the East Channel and the West Channel, the former forking and forming a cut-off Channel known as Hogues Slough.

There is but one Steamboat Channel however. The East Channel being the favored one, as far North as the Hogue Slough fork, where the Channel leaves East Chan-

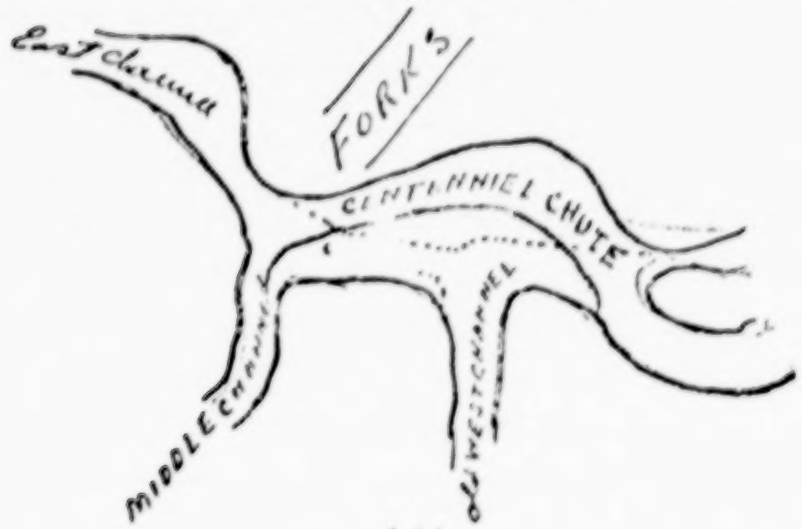
nel or East River and the Steamers find the West Channel through Hogues Slough. The East Channel finds the West Channel about 1½ miles Southeast of Corvallis, where the river is confined for the remainder of its course in one Channel.

Originally the main Channel was by way of the West Channel, but during the flood, of the year of the **Centennial**, 1876, the river changed its course leaving the West Channel by means of a newly formed Channel, which was afterwards named "**Centennial Chute**". Since that time the water has passed in its major quantity down the East river, and the high waters of the succeeding years have now almost completely filled the old West Channel with its deposits of sand, gravel, and sediment, in fact in many places no trace whatever of the rivers bed is visible, no water runs through this Channel except in flood season, when the whole bottom land is inundated and all forms the river bottom.

Still another Channel which I will call "**The Middle Channel**," leaves the East river about one mile North of the old West river fork.

For convenience in describing this point known as "The Forks" I make the following sketch, showing the old West Fork, the original Channel of the river, the present "Centennial Chute" and the present fork of the middle Channel.

Fig. 1. old Bank Channel line ------
new or present bank ———



(4)

Comparatively little water finds its way down the middle Channel at low water; a depth of 3 inches for a width of twenty five feet, was the head over a bar in the Channel. This fork like the main river, consists of pools dammed by shallow bars, which at various points can be jumped, and at others forded without any difficulty, whatever.

This Channel meets the old West Channel at a point by way of the Middle Channel, 3 miles North of the forks, and continues for a distance of about 1½ miles further and meets a stagnant or backed up, Slough, which at high water is fed from a point farther up the river, where the old West Channel left the town of Booneville. This Slough is called the Booneville Channel, and is an over flow from the old West Channel. This addition and in fact the whole as far as Hogues Slough

(the mouth of which is distant about 1½ miles) is a stagnant bay or arm.

Hogues Slough.

The greater amount of water passes through "Hogues Slough". This Channel is a cut-off from the East river and joins the West river, 8000 feet above the mouth of the East river, its course is very winding, the turns very abrupt and the current rapid throughout its whole course and although undoubtly (sic) the best of the Channel is a dangerous Channel to navigate, made doubly so by the sunken and hidden snags or trees, which lie below the surface of the river.

(5)

East Channel.

The East River below the source of Hogues Slough is a very winding, treacherous and shallow stream, with many rapids and bars. The Channel contracts in many places to a width of only 50 feet, and bends away in a direction sometimes greater than a right angle to its direction. Considerable water finds its way down this Channel although at its mouth, where the water is deep, there is but little current and is such that would give an observer the impression that but little water passed through this Channel.

Numerous snags and piles of drift wood are found in East River round which sand and gravel deposits are made and which form the necleus of a bar.

This Channel is exceedingly dangerous, even for a row boat and is impossible, not to say dangerous to navigate, except at very high water.

The Big Bend.

Leaving the mouth of East River at which point the Channels join and form one Channel, that part of the river is almost immediately reached known as "The Big Bend" immediately above Corvallis, here Erosion is going on more or less rapidly all the time and the bank of the river on the East side is tumbling in, and the river gradually working Eastward.

The current here is rapid and strikes the bank with considerable force at an angle of about 45 degrees and is then shot round in a semicircle to reverse and bend

a second time in a semi-circular form ultimately straightening as it passes the town of Corvallis.

At the Big Bend and for considerable distance above it there is great danger of the river changing its course in time and especially if a repetition of the flood of 1890 should occur, with the bank of the river in its present destroyed condition.

Erosion has already begun in two instances, one above Everetts House and hereafter known as No. 1, the other about 700 feet North and below Everetts House hereafter known as No. 2, No. 1 is a great hole scooped out; by the Edding and swiftly running water (which passed over the surface to a depth of about six feet) to a depth in two places 2 feet below the surface of low water and for a length of 700 feet, from this point on to a Slough called Willbanks Slough, a distance of 3400 feet

from the river, the Erosion is very much less, although the path of the swift water is very plainly marked.

Willbanks Slough.

Willbanks Slough is 75 feet wide at the top from bank to bank and about 45 feet wide at the bottom and is 2 feet below the surface of low water of the river. This Slough finds its way in a very direct course to a great Pond called "The Colorado", after a distance of 8900 feet. This Colorado is 1½ miles long and about 800 feet wide at the widest point and 300 feet at the narrowest point. It is separated from the river by a very narrow neck about 4½ feet higher than the low water

of the river and about 200 feet wide. The danger is that the river may cut its way through this neck of 3400 feet of sandy loam to Willbanks Slough and then by way of Willbanks Slough and The Colorado, reach the river three miles below Corvallis; thus leaving Corvallis totally.

There are two projects which could be prepared to avert this danger.

The first is to repair the damage already done by filling in these great holes and continuing the revetment work already begun by the Government all the way round the bend and as far as the mouth of East Channel. Owing to the change in the slope of the bank a slight variation in the project would necessarily have to be made.

The other project would be to divert the course of the river, commencing at a point about a half a mile above the mouth of East river; taking advantage of an overflow Channel (dry at low water) and following this Channel to where it meets the river just above Corvallis—thus cutting off the bend across the bottom land.

The flood of 1890 is chronicled as the greatest flood "The Willamette Waters" have ever occasioned and in all probability it will be many years if at all, such a flood is ever again witnessed. It is my opinion that the threatened danger is not nearly as great as the people of Corvallis and vicinity imagine. However it is essential that this damage should be repaired as early as possible from a financial point of view; for should a flood occur

again with the bank in its present state, the cost of repairing it would be wonderfully increased.

Of the two projects I should recommend the former, as the work already done by the Government has fulfilled its requirements. At the time it was done the threatened cut-off was 2500 feet North of the present danger and immediately where the revetment work stands.

Revetment Work.

The Revetment work is in good repair, save in several places in the row of piling driven in the bank which is completely carried away. These piles should have been driven deeper into the bank when their stability would

have been greatly increased.

I would also recommend that the stone revetment be carried higher up the bank, and that the bank and the land immediately in the vicinity of the bank be planted with balms or willows, something which will take root quickly and by their presence and their roots, make the cohesion of the bank greater and lessen the possibility of the wearing away of the top of the bank by the over flowing water. These balms or trees could be planted by the land owners themselves and at but a trifling cost to them.

The error was with the land owners in cutting down the thick growth of trees and shrubbery, which grew right where it was most beneficial and where the Erosion began directly they were cut away.

The project for diverting the river Channel is hardly

a likely one, owing to the fall of the river between the two points. By the river the distance is 14000 feet, by the cut-off 3500 feet. The fall is 8 feet. The current of the river is even now very rapid in its distance of 14000 feet and would be largely increased through the cut-off.

On comparing the two projects noting the difficulty with which shipping would have to navigate the cut-off; I would strongly recommend the repairing of the revetment work, now existing and its continuance further South, as far South as the mouth of East river.

The difference in elevation of the high water of

Febuary (sic) 1890 and the low water in December of the same year, was twenty-nine feet. The elevation of the river bank in the vicinity of the Big Bend is only twenty three feet, and is of such a slope that the bank to an elevation equal to the high water is about five miles distant.

The only means by which the over flowing waters could be checked, would be to build a Levee, commencing at a point about two miles North of "The Forks" where the high bank bears away Eastward and running along the East bank of East river to a point about ¾ of a mile below Corvallis.

The length of this Levee would be a minemum (sic) 30400 feet practically five miles; which is in a very direct course and which if made to follow the banks of the river would be greatly increased. This Levee would

necessarily have to be about ten feet higher than the present top of the bank and with a slope of 1½ to 1, would require a base 40 feet wide and ten feet on the top.

The amount of land that would be reclaimed by this would roughly be about ten square miles or 6400 acres.

The acerage (sic) that is most damaged by the high water is about 1280 acres or about two sections. This would be a very great expense to build and on account of the great expense would make the project wholly impracticable.

Hurdle Work.

The row of piling or Hurdle work in the bank has proven more of a detriment than a benefit and I would recommend that it be discontinued, and the improvement be confined to the revetment and piling at the water edge. Along the Hurdle line Erosion has taken place to a great extent, caused by the accumulation of driftwood and debris, which acts as a dam and over which the water pours to the ground on the opposite side, thus wearing it away and undermining the piling and ultimately tearing away the Hurdle work. If this were removed and the high water allowed to pass freely over the land, I am of the opinion that the Erosion would be very much lessened and the danger of the rivers cutting a new Channel materially lessened.

A line of levels were run from the Forks to a point one mile below Corvallis, the fall of the river being

found to be twenty five feet, this is by the river about nine miles giving a fall of 2.77 feet per mile of river.

A section of the river was taken at Corvallis and discharge observations made.

Levels were taken over.

1st. The cut-off across the bottom land for the purpose of obtaining information relative to the advisability of changing the rivers course, also 2nd. across the threatened cut-off.

A section 2½ miles long from the high bank on the

East side to the high bank on the West side was run and the levels taken over this section.

Accompaning (sic) the Map of the country surveyed and examined, and this report are; profiles of the flood section line, the cut-off and the threatened cut-off and the sections showing the bank of the river in the vicinity of the bend, with diagrams of proposed project for improvement.

Also a tracing showing the bend as it was when the land Office caused the sectionizing of the country in 1851, and its present position relatively.

The manner in which the notes for this survey were gotten are briefly as follows:—

A Channel transit line was run on the East side of the river from the Ferry landing North to the North boundary of the survey, South from the same point following the bank of the river round the Big Bend, to

(12)

within a quarter mile of the mouth of East river. The opposite shore of the river was gotten by Stadia observations the transit being at points on the transit run line.

Offset measurements were taken at each station of 100 feet to the high and low water lines, as well as to the rows of piling, Hurdle work and revetment.

A transit line was continued up the West Channel, on the West side, the presence of a forest making it necessary to triangulate across the river. The opposite side of the river was gotten by Stadia observations as before.

East River and Hogues Slough were meandered by the Stadia altogether, the growth being so close to the rivers banks made it necessary to adopt this method and the check made by these two lines was remarkably close, 180 feet in a distance of about 14 miles.

Discharge observations were taken in the vicinity of Corvallis immediately at the Ferry crossing, where the rivers bottom is quite regular.

Calculations made from this data, shows a discharge of 3478 cubic feet of water per seconds.

That which passes Portland, Oregon, is 15000 cubic feet per second. The great variance in these figures is accounted for by there being a number of rivers tributary to the Willamette, between Corvallis and Portland.

(13)

The courses were worked up into Latitudes and Departures and platted accordingly. The condensed record is now placed on file in this Office, as "Latitudes and Departures, Willamette River, at Corvallis, Oregon, 1890".

The Map is platted to a scale of 400 feet to an inch.

I have the honor to be Sir,

Very respectfully,
Your obedient servant,
J. M. CLAPP
Asst. Engineer.

U. S. Engineers Office,
Portland, Oregon, Sept. 1st, 1891.
Page Numbers by W.E.M.

To accompany Report of Asst. Eng. Clapp,—Sept. 1, 1891

DATA

Flood Section of the Willamette in Vicinity of Corvallis, Oregon

Area of flood section		132,395 sq. feet.
Net perimiter,		13,416 feet.
Length of section,		13,000 feet.
R = Hydraulic Radius,	$\frac{132895}{13416}$ =	$9,\frac{906}{1000}$ feet.

Elevation.

L. W. Surface at Forks South boundary point A =	244.38
H. W. " " " " " " A	262.91
L. W. " " Carys Ranch Point B	242.86
H. W. " " " " " " B	261.35
A is distant from B	2500 feet
H. W. at point C	253.40
L. W. " " C	242.25
C is distant from A	11,000 feet
L. W. surface at Corvallis Foot of Van Buren Street	219.23
H. W. " " " Foot of Monroe Street	248.27
L. W. " " D a point 7,000 feet below Corvallis	213.0
H. W. " " D " " 7,000 " " "	244.5

"D" is distant from A by the River 55,000 feet or $10,\frac{417}{1000}$ miles

D in a direct line 32,700 feet or $6,\frac{193}{1000}$ miles

L. W. Surface at E a point 16,000′ below Corvallis,	217.1
H. W. " " E " " 14,000′ " "	242.51
W. S. of Colorado	220.80

E. is distant from A by the river 62,000 feet = 11.74 miles

straight 35,700 = 6.76 miles

Difference in elevation of L. W. at A and at E	27.23 ft.
H. W. difference at same points,	20.40 ft.

L. W. fall of river per foot = $\frac{27.28}{62000}$ = .00044 or fall per mile 2.324 ft.

H. W. fall in direct course per foot = $\frac{20.40}{38,700}$ = .0005714 or fall per mile 3.018 feet.

Distance from point A to Corvallis by the river through Hogues Channel equals, 9.091 miles

Therefore L. W. fall per mile to the City of Corvallis, 2.7609 ft.

and

Distance from A to Corvallis in a direct line (H. W. Path = 28,000 feet. equals 5.303 miles.)

Difference of level of high water between these points, 14.64

Therefore H. W. fall per mile to the City of Corvallis = 2.74184 ft.

J. M. CLAPP

Assistant Engineer.

Nov. 15, 1891.

STATE EXHIBIT 98A

Corvallis, Or.
November 29th 1890

Major Thos H. Handbury
Corps of Engineers
U. S. Army

Major:

I have the honor to report the progress of the survey of "The Willamette River" in this vicinity for the week ending November 29th 1890.

I have completed the survey of that portion of the river below Corvallis and am now pushing the triangulations up the Main Channel above Corvallis.

I have walked all over the ground and found many overflow channels and also several of the section corners among which is the township corner just east of the big bend above the city.

I intend to run the Stadia Meander up the Main Channel as far south as the limit of the survey and work from there northward. This I consider the wiser plan as during this weather the river I am told is at its lowest stage. Should rain come soon the river might raise and not afford such a good opportunity to get the present low water line.

I have established a stake flush with the water at either end of the survey in order to obtain the fall of the river during its present state. The levels I will take between these points early this coming week. I have found many marks established by the citizens of

Corvallis and the farmers round about here which will enable me to find accurately the fall of the river during the high water of February 1890.

I have made many inquiries regarding a section of the river in which was contained all of the water during the flood. The narrowest place I have learned was over a mile wide and is somewhere in the neighborhood of Peoria. In the vicinity of Albany the Oregon Pacific Railroad Company have the profile of a bridge crossing but this is below a river tributary to the Willamette and which I am told is a large feeder. This section would not be a true section of the volume which passes Corvallis. I can run this section near Peoria and take the levels over it from H.W.M. to H.W.V.

I have seen the threatened cut off but have not examined it carefully enough to make a report about it.

The Government work which is nearer the river, that is the water now of piling is in very good repair; but a few of the braces which are spiked to the top of the piles have become loosened and could be repaired at but a little cost. The stone revetment work has sunken and slid down the bank; in some places not a little. This is, I judge, caused by the bank being at too great a slope to hold the stone.

Some of the willows and balms used in making the fascines have taken root and have grown from two to five feet high.

The upper or land now of piling has suffered very

much, large portions of it are completely gone and great holes scooped out where they have stood. This now of piling was driven, about 4½ feet into the ground.

I have found a place which appears to carry a considerable quantity of overflow water and which might be converted into a cut off of the bend. I have only walked over this, and will examine it thoroughly again.

If it were cleaned of the driftwood and willow growth so as to give the high water a free channel, I think that the water would enlarge it very much and probably change the course of the river of its own accord as it is a direct chute and the material of a sandy nature.

I am working now about three miles above the town just round the big bend above the city. The weather has been very favorable and I am getting on very well.

Newspaper men have asked me several questions, I have told them I had no information to give beyond that we were making a survey of the Government and have referred them to you.

I have the honor to be

Sir

Very Respectfully Your Obedient Servant

J. M. CLAPP
Assistant Engineer

EXH 110-A, U.S. CORPS OF ENGINEERS
LETTER OF JANUARY 10, 1906

U.W&Y.

UNITED STATES ENGINEER OFFICE

321 Custom House

P.O. Drawer 50 Portland, Oregon

January 10, 1906.

Major S. W. Roessler,
Corps of Engineers, U. S. Army,
Portland, Oregon.

Major:

In accordance with your instructions, on January 4th, I made examination of the Willamette River in the vicinity of Corvallis and found a substantial fraction of the river flowing through the high water "cut off" channel above the City as reported in Mr. August W. Fisher's recent letters to this office. It is roughly estimated that about one quarter of the flow of the river is carried by this channel.

The channel in question is across the neck of a peninsula and is some 3,200 feet long, while the distance around by the main river is two and one quarter miles.

This channel has existed for a number of years as maps on file in this office show it in practically the same location in 1890, though the mouth of the channel was then closed by a gravel bar. The fall from its head to

its foot is noted as about 8 feet. The approximate present location of the channel is shown in dotted lines on the sketch herewith.

The river was at a 4 foot stage at the time of my examination and the banks along this new channel showed indication of recent caving, particularly towards its lower end. The land at the foot of the channel and along the west bank of the Willamette to the mouth of Mary's River is owned by the Corvallis Flouring Mills, and Mr. Fisher, who is the executor and Manager of these mills is naturally apprehensive of injury to his property as well as to navigation and is therefore desirous that the United States make an effort to prevent the development of this new channel.

It is a question whether this channel will increase greatly during high water and even should it do so, whether any actual injury to navigation would result, for the reason that boats use the river above Corvallis very little and then only during high stages, at which time there would be ample depth in the river notwithstanding the "cut off".

It is estimated that a closing dam at the head of this "cut off" of piles, brush and stone, with necessary shore protection at each end, would have to be from 800 to 1,000 feet in length and would cost several thousand dollars if constructed under favorable low water

conditions, and as the interests of navigation do not at present seem imperilled the expenditure seems not justifiable.

This was explained to Mr. Fisher, who visited the "cut off" with me, and he was asked to keep this office informed of any change in the conditions and he was given permission to keep the cut free from lodging trees at its lower end for the purpose of preventing further scour of his land,—and this seemed satisfactory to him.

It is recommended that a further examination of the "cut off" be made at the close of the high water season next spring.

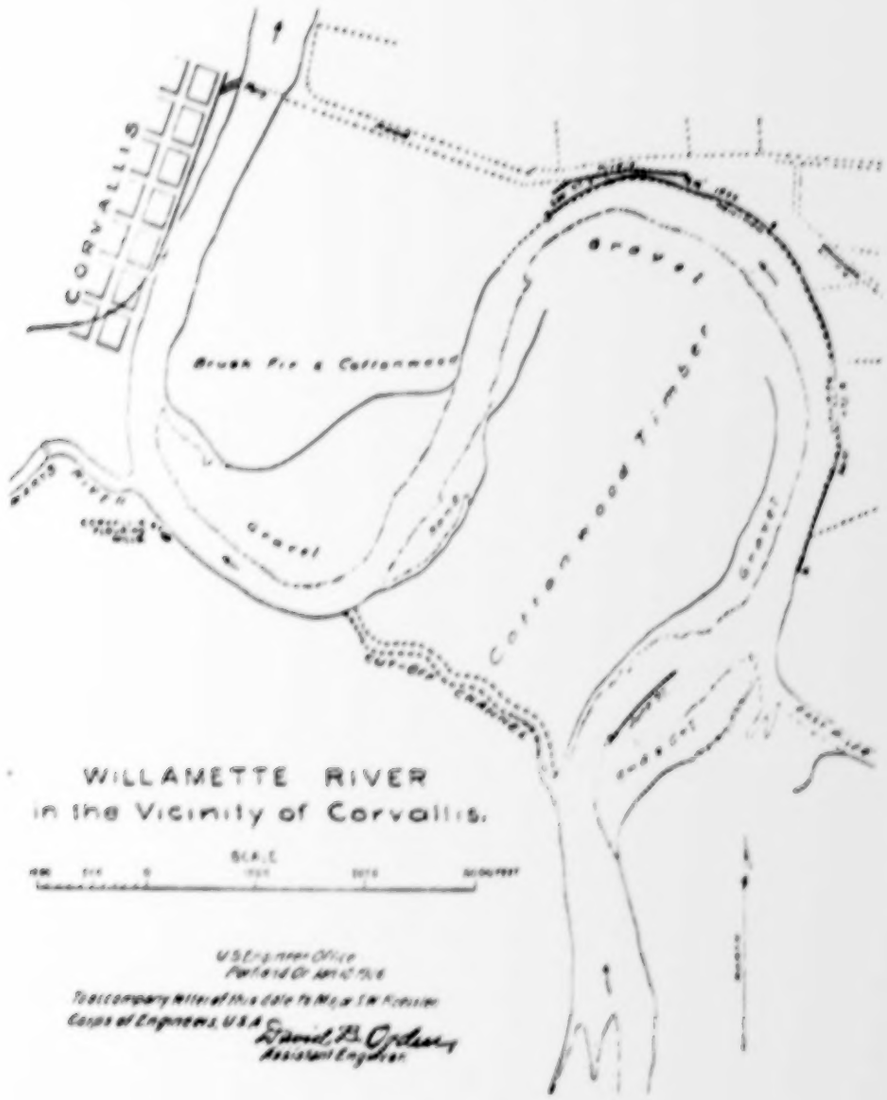
While at Corvallis I also made examination of the mile or more of revetment above the City formerly constructed by the United States and found it to be in good condition.

Very respectfully,

DAVID B. OGDEN

Asst. Engineer.

1 Inclosure.



STATE EXHIBIT 112A

Report of J. H. Cunningham
Assistant Engineer
Portland, Ore.
November 26th 1895

Major James C. Post
Corps of Engineers U.S.A.

Major:

I have the honor to make the following report accompanied by maps, in the survey of the Willamette River from Eugene to Portland.

Obedient to your instructions I left Portland for Eugene October 2nd 1894 and after building a quarter boat and small skiff at Eugene the survey was commenced on October 6th and continued during the months of October, November and December 1894 and March, April, May, June and September 1895.

The work was completed on September 17th 1895. The total time lost on account of high water during these months was one month and a half making the actual time employed on the survey just six months.

The total length of the present main channel from Eugene to Portland is 171½ miles. The side channels and sloughs that were surveyed and mapped will aggregate 76.6 miles. Total length of main and side channels surveyed 248.1 miles.

The maps accompanying this report are drawn on a scale of 1 inch to 1000 ft with exception of the detail maps of special localities which are drawn on a scale of 1 inch to 500 ft. The total fall of the low water

surface from Eugene to Portland is 396.00 ft. Following is a table showing the fall per mile, etc. between different sections of the river.

In ascending the river from Portland the first impediment to navigation is at Clackamas Rapids, 11½ miles above Portland. This is a difficult point for boats to navigate at low stage. The rapids are about 2,000 ft long and at low water will average 150 ft in width and from 5 to 30 ft in depth with a total fall of 5.1 ft. This gives a very swift current at low stage. The bar at this point is caused by gravel brought down by the Clackamas River during freshets. By causing this gravel

to be precipitated on the right side of the river some 500 ft from the steamboat channel this channel might be improved.

. The proposed improvement consists in building a dike from the junction of the right bank of the Willamette with the left bank of the Clackamas River and extending in a westerly direction parallel with the Willamette River for about 2000 ft down stream. This would deflect the current of the Clackamas River parallel with that of the Willamette and having assumed a lesser slope and velocity it would precipitate its debris before reaching the steamboat channel.

Ash Island

From the Clackamas Rapids after passing the locks at Oregon City there is no obstruction to navigation til

Ash Island is reached, 38 miles above Portland. At present the left hand channel is used at low water, but by removing the Wing Dam at the head of the island across the right channel and building a low dam across the left channel it would be an improvement.

At low water boats have some difficulty in going up the left channel on account of shallow water about half way up. The Wing Dam across the head of the right channel is doing no good at present as water is flowing through and around it freely and it only serves as an obstruction to boats passing through this channel.

Candiani Bar

At this point the water divides about 30% of the water passing down the right channel. The old wing dam across head of right channel is doing no good and as this channel is gradually becoming deeper it is probable that if this Wing dam was removed and the snags pulled out this right channel would be preferable to the left.

At present boats navigate the left channel, but as there is a very sharp bend about half way down, and as the depth is decreasing it is evident that the right channel will carry the bulk of the water if it is cleared of obstructions.

Weston Bar

At this place the lower wing dam should be removed as it is an obstruction to navigation, and the upper one repaired and extended to connect with the left bank. Ac-

cording to reports of steamboatmen this upper wing dam has been beneficial in improving the channel and should be maintained.

Table No. 1

Town	Dist. Mis.	Elevation of Low Water Feet	Total Fall Feet	Fall per Mile Feet	Diff. bet. Low & High Water Feet	Remarks
Portland	11.2	0.0	0.50	0.044	33.5	Low Water Oct. 1895 -0.50 on Stark St. Gage
Foot of Clackamas Rap.	0.5	0.50	5.14	10.28		
Head of Clackamas Rap.	1.8	5.64	0.0	0.0		
Oregon City Below Falls		5.64			48.2	Feb. 1890
Oregon City Above Falls	23.45	47.35	2.93	0.12	21.1	Feb. 1890
Roger's Landing	34.85	50.28	56.72	1.63		
Salem	11.00	107.00	22.40	2.04	40.9	Dec. 1861
Independence	23.70	129.40	36.31	1.58	31.94	Feb. 1890
Albany	11.75	165.71	18.14	1.54	31.94	Feb. 1890
Corvallis	12.64	183.85	31.85	2.52	25.00	Approximate
Peoria	20.36	215.70	70.78	3.42	19.5	Approximate
Harrisburg	20.15	285.48	109.53	5.01	15.5	1890

(Ex 112A p 3)

Feaster's Rocks

About one half mile above here the channel divides at low water, the left channel however is the one used by boats at present. But if the snags were removed and the water deepened a little at the head, the right channel would be much the best. This was formerly the old steamboat channel.

Wheatland Bend

About one half mile below Wheatland, the high water chute to left is becoming deeper, it now begins to draw water at the 2 foot stage, immediately above this chute, on left side, the bank is about 20 feet high composed of clay with gravel subsoil near the low water line. This bank is caving very rapidly, and, at one place it runs out to a very narrow neck only 30 ft wide. The river is liable to break through here any time at high water, in which case it is probable that nearly one half the water would pass down Lambert Slough to the great detriment of navigation below this point. Revetting the bank and building a dike across this the head of this chute is suggested as an improvement. The total length of this revetment and dike would be about 2300 feet.

Windsor Island

At the upper end of this island the chute to left draws about 5% of the water; a wing dam across the head of this chute would improve navigation around the right side of Windsor Island. The left bank of this side chute is about 20 feet high composed of a sandy loam on top and a sand and gravel subsoil. It is proposed to build the wing dam some 200 feet down this channel and immediately below where the small slough comes in, thus confining the waters of both these side chutes to the main channel.

Salem

I made a careful examination of the river banks at this point as it is thought by the people in West Salem that there is danger of the river cutting through the bank where the high water current is shown on detail map. The bank here is composed of a good stiff clay with about 2 feet of sandy loam top soil, and is from 10 to 15 feet high. At extreme high water there is from 20 to 30 feet of water across this bend, but I failed to find any evidence of much current. There is no drift except on the low water line and the top soil which is a sandy loam of about 2 feet in depth shows no indication of erosion by the current except near the river.

It is a significant fact that the people of Salem do not seem to be alarmed, and the farmers living on the west side are the only ones showing my concern; and this appears to be principally for their crops and buildings which are sometimes destroyed by high water.

(Ex 112A p 4)

Romers Bar

At present this is the head of navigation at low water, but by closing the side chute to left above Doves Bar it would make both these bars navigable.

This side chute draws about 10% of the water and could be closed by a wing dam 300 feet in length.

Independence Bend

About one mile below Independence where the river bends to the right, there is some danger of a low water

chute forming leading to La Creole Creek about five miles north; at the 8 foot stage water begins to pass over the high water outlet (shown on map) to a narrow deep slough about 2000 feet from the river and leading north to La Creole Creek. There is considerable drift along this high water outlet showing the presence of a strong current. It is proposed to protect the bank here by a revetment 1500 feet long and extending at least 10 feet above low water.

Santiam Bar

The greatest depth I found on this bar (during low water of November 95) was one foot. This is less water than I found anywhere between here and Portland. From observations of this place at high water during the month of April 1895 it appears that the Santiam Bar is formed by the meeting of the currents of the Lower Santiam River and the Willamette at nearly right angles. This checks the two currents sufficiently to cause them to precipitate the debris at this point.

During the high water of April 17th 95 (seven and one half feet above zero of gauge) I noticed a large whirlpool at this place and a cross current from the Lower Santiam setting in towards the wing dam opposite. This would indicate that the Santiam deposits its gravel over near the old wing dam on the left shore of the Willamette while the checking of the current of the Willamette causes it to pricipitate (sic) its debris immediately above the mouth of the Lower Santiam. To

prevent this it is proposed to build a wing dam from where the right bank of the Willamette intercepts the left bank of the Lower Santiam and extending down stream (nearly parallel with the old wing dam on the left side of the Willamette) about 600 feet. This dam should project at least 8 feet above low water.

Black Dog Bar

Very shoal, about 1½ foot deep at low water. The side chute to right above this bar draws nearly 10% of the low water flow. By closing this side chute I estimate that this bar could be deepened about four inches or more. It is proposed to build a dam 500 feet long extending from the right bank across the side chute to and around the head of

(Ex 112A p 5)

the island shown on map. This dam should extend about four feet above low water.

Pine Tree Bar

1½ foot deep at low water. There are a few piles left from the old wing dam but from what I can learn this dam was of no benefit and the channel would probably be deepened by removing the remaining piles as they only serve to collect drift.

Bowers Bar

The reef of rocks running out from the right shore and extending to within 100 feet of the left bank, leave a narrow deep channel next to the left bank but as the current is very strong towards this bank it makes

a dangerous place for boats coming down stream. These rocks rise but a few inches above low water and could be easily blasted out.

Magoogalon Bar

There is less than a foot of water at the head of this bar. The chute to right draws about 10% of the low water flow. By constructing a wing dam from the right bank above this side chute diagonally across the upper end of the gravel bar and concentrating the low water discharge in the left channel, this could be made navigable. From this point to Corvallis the ruling depth is not less than 3 feet.

Above Corvallis

The river divides into numerous branches, very crooked swift and narrow. In the main channel it ranges from 1 to 40 feet in depth. The bed is uniformly of coarse gravel and the banks are from 5 to 20 feet in height. In times of freshets all banks under 20 feet are covered by high water (except above Peoria where the flood level rarely exceeds 15 feet).

As the banks are generally of a loose sandy soil or gravel, they are constantly caving and precipitating trees into the river. It is impossible to prevent this by any reasonable expenditure except in a few cases. The revetment built in the Spring of 1895 above Corvallis, seems to be holding very well, but has had no severe test yet as there has been no high water since it was built.

About one mile below Harrisburg the river bends sharply to the left, the current is very swift and the right bank which is 15 feet high and composed of yellow clay and gravel is caving rapidly. From information received I should estimate that a strip 200 feet long had washed off during the past ten years. During the flood of 1890 a strip about 24 feet wide was washed off.

It is proposed to protect this bank by a revetment about 3000 feet long.

* * * * *

STATE'S EXHIBIT 114

UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY

Portland, Oregon 24 June 1971

I HEREBY CERTIFY that

[certificate omitted in printing]

ANNUAL REPORT

OF THE

CHIEF OF ENGINEERS

TO

THE SECRETARY OF WAR

FOR

THE YEAR 1871.

WASHINGTON.

GOVERNMENT PRINTING OFFICE.

1871.

(Pages 906 and 907)

* * * * *

SAN FRANCISCO, CALIFORNIA

December 23, 1870.

MAJOR: In accordance with your order of September 7, 1870, I left Portland, Oregon, with my party, on September 8, and proceeded up the Willamette River by steamboat to Salem, Oregon. This was done to see the obstructions to the navigation of the river, as well as what had been done toward improving it by the Steamboat Company.

After leaving Oregon City, we steamed up the river

for about five miles and arrived at Rock Island, where the river widens and the channel becomes tortuous. During high water the river rushes down the channel, which contains points of rocks and rocky reefs, under which eddies are formed, rendering navigation difficult; but during ordinary stages of the river, steamboatmen consider it perfectly safe. They do not, therefore, deem any immediate improvement necessary. After leaving Rock Island, the river contains a good depth of water, until we arrive opposite the mouth of Molalla River, one of the tributaries of the Willamette, ten miles above Oregon City, where a shoal is formed consisting of small gravel and boulders. As the boats cross the shoal without difficulty, no improvement is deemed necessary here. Proceeding farther up the river, we find deep water, until arriving just below the mouth of the Yamhill River, another tributary, about thirty-five miles above Oregon City. Here a shoal extends entirely across the river, carrying about three feet of water. The river is about 1,000 feet wide, the channel narrow, and the current rapid. The shoal is gravel, which vary in size, but averaging about four inches in length, nearly flat, with rounded edges. This shoal is probably due to the increased width of the river, as well as to the gravel brought down by the Yamhill River during its annual freshets. The river might be temporarily improved here by a system of wing-dams, but the boatmen say that bars higher up the river are so much worse than

this one that they do not consider the Yamhill Bar a serious obstacle to navigation.

Between Yamhill Bar and Salem are numerous shoals, covered by 24 to 30 inches depth of water, with deep water between them. The names of the bars are Runaway Bar, Bennett's Dread, Five Islands, Two Head, Matheney's, Beaver and Lone Tree Rapids, McCloskey's Chute, and Chitwood Bar. Each of these shoals are of the same nature. Of the bars just mentioned, Matheney's, Beaver, and Lone Tree Rapids and Chitwood Bar are the worst, on account of the channel being less wide and more tortuous than on the other bars. The depth of water is about the same on each of these bars.

Steamboats navigate the river between Oregon City and Salem (sixty-five miles) during the entire year, and as far as Corvallis forty-two miles above Salem, during nine months of the year. During a high-water stage of the river, they run up as far as Eugene City, about eighty miles above Salem.

From the 1st of October to the 1st of August the river is said to be high, and the boats make their trips regularly, transporting heavy loads of freight; after that navigation above Salem ceases, and all towns above Salem either have to wagon their grain and supplies to or from Salem or stow them away until navigation reopens.

The bars between Salem and Corvallis are not very numerous. They are of a similar nature to those below,

but have a few inches less depth of water, and the boulders become larger as we go higher up the river. Above Salem we surveyed Humphrey's Rapid and Bowers Bar. They are considered the worst bars in the whole river, and if they were improved, it is thought navigation would open to Corvallis during the entire year. The names of the other bars above Salem are Eola Bar, Rocky Rapids, Independence Bar, Buena Vista Bar, Luckamute Bar, and Long Crossing. None of these, however, are considered serious obstacles to navigation. The upper Willamette River varies in width from 300 to 1,000 feet; its average width from Albany to Oregon City is probably 500 feet. At every shoal on the river it is wider than it is immediately above or below the shoal. The difference between the highest water and low water of this river varies at different places. Where the banks are high it is said to be as much as 60 feet; at Salem it is about 40 feet. The banks of the river generally are low, and heavily timbered for a distance of about half a mile in width; beyond that is fine prairie land, forming by far the most valuable farming land in the State.

During the year, October 1, 1869, to October 1, 1870, 51,437 tons of freight were carried by the boats navigating the river. The People's Transportation Company monopolize the carrying trade of the river. They run seven steamboats above the falls at Oregon City and two below. Within the last few years this company has improved the navigation at Chitwood, Matheney's and

Runaway Bars by building wing-dams in the river, thereby contracting its width and causing the increased current to wash the finer gravel from the shoals into deeper water below the dams.

The results in some cases were satisfactory, and would have been better had the dams been better constructed and placed in more favorable localities. As a rule, they were roughly constructed, and consisted of a log being thrown into the stream, making an angle of about 135° with the current. Willow bushes and gravel were then thrown in on the up-stream side of the log. The log, being aground, would remain in place until the water raised, when it would be carried away. In a few instances the dams were constructed by driving light piles into the gravelly bed of the river, then placing the logs against the piles, and brush and gravel against the logs. The dams so constructed are still standing.

The danger to be apprehended in building wing-dams in the river is, that the current striking the dam is deflected to the opposite shore, which, if it be of a soft character, is gradually washed away, leaving the river as wide as before the dam was constructed. When the banks are washing away, the trees fall into the river, ground, and offer a partial protection to further wash until the river rises and floats them off. The current then carries them off until they lodge on some gravel-bar, where they form a wing-dam, and sometimes pro-

duce a bad effect. The river pilots say that at nearly every bar the channel changes from year to year; it is therefore, probable that any change which a wing-dam will produce on a bar will be temporary. It will produce an increased depth of water, but the gravel which it scours out will be deposited below, and may make another shoal as bad as the original.

Surveys were made of the following-named bars of the river, fix: Bower's Bar, Humphrey's Rapid, Chitwood Bar, Beaver and Lone Tree Rapids, and Matheney's Bar. Maps of each of these bars accompany this report. They will not be described in the above order, commencing at

BOWER'S BAR.

This obstruction is three miles above Albany. The river suddenly widens from 225 feet to 400 feet, where the shoal is found. The distance from 3 feet depth of water above, to the same depth below the shoal, is 150 feet. Average depth of water on the shoal is 2 feet. The current flows nearly west, with a velocity of 400 feet per minute. Immediately above the shoal the current is less rapid. The bed of the river is gravel, averaging about 2 pounds in weight; some of them, however, weigh as much as 20 pounds. Near the shoal are three bare gravel-bars, two of them on the north side of the channel, the other near the mouth of the creek on the south side of the channel. The lower of these bars is gradually washing away on the channel side. The south bank of

the river is clay, stands nearly vertically, and is also gradually wearing away. The north bank is a gravelly shore, having a gradual slope from the water's edge for a distance of about 200 feet. Beyond that we find timber. The river can be improved here by building a wing-dam from the foot of the northerly gravel-bar to the head of the lower bar. This would be 325 feet long, would concentrate the current, and cause it to scour the shoal, but would also undermine the south bank and cause it to wash. This can be remedied by piling close to shore, and then throwing in logs and brush behind the piles; 500 linear feet of piling would probably suffice. The estimated cost of the wing-dam is $900; that of the bulk-head for shore protection, $2,600, making a total estimated cost of this improvement, $3,500.

After leaving Bower's Bar, we pass down the river without meeting with any serious obstacles until we arrive at

HUMPHREY'S RAPID.

This obstruction is about twenty miles, by river, above Salem. The bed of the river is gravel, like that on the other shoals, but the obstruction consists of two rocky reefs, nearly parallel to each other, about 150 feet apart, putting out from opposite sides of the channel. The lower one projects from the south shore, and is 125 feet in length, but an average width of 75 feet. The upper reef puts out from an island on the north side of the channel for a distance of 250 feet, and has an aver-

age width of 100 feet. These two obstacles cause the boat, in ascending or descending, to make two sharp turns in contrary directions, (like the letter S,) and the current being rapid, (nearly 400 feet per minute,) has a tendency to throw a boat, in crossing, broadside on the lower reef, which is covered by about 2 feet of water. The upper one is barely covered. A channel can be made by blasting through either of these ledges of rock, but the work would be very expensive. An equally good channel, at a small cost, can be made between the island and the north shore. This chute contains an average depth of 15 feet of water, except at its upper end, and for a distance of 300 feet, where there is less than 3 feet of water. This shoal, however, is all small gravel, none of it any larger than an egg; and if a wing-dam 220 feet long was constructed diagonally across the current, its lower end abutting against the head of the small gravel bar near the head of the island, the increased current would soon scour out the small gravelly shoal, and give a channel 75 feet wide in its narrowest part.

At the end of the island was an immense accumulation of drift, probably 20 feet high, which lodges there during every freshet. This was set fire to and burned out in a few days. The only objection to building a dam at the head of this bar is, that it might catch the drift and choke any channel which it might form. This is not probable, because the gravel-bar against which the dam would abut is about 3 feet high, whereas the top of the

dam would be but a few inches above the water surface. The estimated cost of building this dam—220 feet in length—is $700.

The next important obstruction below this is called

CHITWOOD BAR.

This is about a mile and a half below Salem, and gives the steamboat men considerable trouble during low-water stage of the river. The river contains a long gravel-bar or island, the foot of which is about 600 feet above the shoal. At the shoal the river widens suddenly from 300 to 675 feet. Immediately above and below the shoal is a good channel, carrying upward of 3 feet of water. Length of the shoal between the 3-foot curves, above and below, is 475 feet. On the west bank, a little above the shoal, is a wing-dam 150 feet long; another was built from the foot of the island, and is 550 feet long. The shoal commences at the foot of the long wing-dam, and extends across the river, covered with from 20 to 30 inches of water, In the prolongation of the shorter wing-dam, and distant from its foot about 140 feet, is a pile driven into the gravelly bed of the river. In ascending the river, the boats hug the west bank until they arrive about 150 feet below the wing-dam; a line is then taken from the boat and one end made fast to the pile, the other end remaining on board wound around the capstan. The boat then backs; the result is, that she is carried into midstream, and held there by the line. The Engine is then quickly reversed, a few feet of progress

made, and the spare line taken in. The probabilities are that by this time the boat is aground. She again commences to back, which throws a little water under her, and causes her to raise a trifle on the wave so produced. The engine is again quickly reversed, and more progress made. This process is repeated, sometimes for hours, until the boat reaches the pile, after which she has no more difficulty. While surveying this bar, a break 100 feet long occurred in the long dam near the foot of the island. The water, which was 2 feet deep before the break, soon increased to 8 feet depth. A good channel can be made through the break of this dam by throwing a dam 200 feet long from the west bank, 500 feet above, and parallel to the one already built on this bank. The lower dam should also be lengthened 200 feet. The channel would then be on the east side of the river, until, crossing through the break of the long dam, we would again arrive in deep water, in the old channel above the shoal.

The estimated cost of this improvement is $1,400. The east bank would also have to be protected by a bulk-head of piles and logs. This is estimated at $2,600.

Leaving Chitwood Bar, we pass down the river nine miles, and reach

BEAVER AND LONE TREE RAPIDS.

* * * * *

STATE'S EXHIBIT 114C

52d CONGRESS, 2d Session.) HOUSE OF REPRESENTATIVES. (En. Doc. 1, (pt. 2, (vol. II.

ANNUAL REPORT
OF THE
CHIEF OF ENGINEERS,
UNITED STATES ARMY.
TO THE
SECRETARY OF WAR,
FOR
THE YEAR 1892.
IN FOUR PARTS AND ATLAS.
PART III.
WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1892.

(Pages 2847 through 2850)

* * * * *

SURVEY OF WILLAMETTE RIVER NEAR CORVALLIS, OREGON.

UNITED STATES ENGINEER OFFICE,
Portland, Oregon, October 30, 1891.

GENERAL: The river and harbor act approved September 19, 1890, provides that an examination and survey be made with the view to improving the navigation of the Willamette River, near the city of Corvallis, Oregon, and also that an estimate of the cost of the necessary improvement be submitted. This duty having been

assigned to me by your letter of October 21, 1890, I now have the honor to submit the following report* thereon:

*Map accompanying this report not printed.

(Ex 114C p 2848)

The reach of river deemed necessary to be surveyed in order to arrive at a proper conclusion as to what should be done in this case extends from a point 2 miles below Corvallis to a point 5½ miles above, measured in a straight line. By the meanderings of the present steamboat channel the distance between these extreme points is 13 miles. The average low-water slope throughout this reach is 2.44 feet per mile. The slope at high water is 2.36 feet per mile. Throughout a portion of the distance above Corvallis the low-water discharge is divided between three channels, and during the extreme high water the whole valley, with the exception of a few isolated patches, is overflowed. The least distance between banks not overflowed within the limits of the survey is 2½ miles. The high bank opposite Corvallis is 6 miles distant. The bottom is cut up with sloughs, high-water channels, and old river beds, that serve as outlets for the water at medium and ordinary high-water stages. A portion of the bottom is covered with a thick growth of timber and underbrush, and another large portion on a little higher level has been cleared and is under cultivation. The soil here is rich and brings forth abundant crops when they can escape overflow.

These lands are subject to overflow at stages ranging from 12 to 20 feet above the low-water stage of the river. The extreme high water of February, 1890, reached 29 feet.

Before these bottom lands were cleared and placed under cultivation the heavy timber and underbrush with which they were covered retarded the water during the periods of their overflow and prevented the washing away of the soil. At the medium and low stages of the river, when it was confined between its banks, the erosion of these banks was limited, on account of the hard nature of the substratum on which the soil rests. This in general is compact gravel or a mixture of clay and sand, offering considerable resistance to the erosive action of the water. At places the soil or sand more loosely formed will extend below low water. When the land is cleared off and the soil loosened up by cultivation the high-water currents have a more marked effect upon the top layer of soil. The damage is greater and more noticeable as the country becomes more settled and more of the ground is brought under cultivation. This land is not overflowed every year; sometimes a period of six or eight years may elapse without a serious flood. Its exceeding great productiveness induces the farmer to take these chances.

In the reach of 3½ miles from Corvallis upstream the river makes a well defined S. In the upper curve of this S it has been slowly eroding its banks, making the

curve deeper. Plotting the original meander notes made in 1852, obtained from the surveyor-general's office, on our recent map, it appears that the apex of the concave bank has advanced 7775 feet, or at the average rate of 20 feet per year. The land that has been washed away amounts to 54 acres. The value of this at present prices should not exceed $2,000.

In this locality we find several low places in the land, through which high water escapes across the neck into the river below. Some alarm has been felt lest the whole body of the river might break through here and leave Corvallis some 4,000 feet from the navigable channel of the river. The river and harbor act of 1888 authorized the expenditure of $14,000 in revetting this bend to prevent the threatened change of channel. The bank was graded down to a slope of 1 on 2 and revetted with brush and rock over a width of 18 feet for a distance of 1,676 feet. This effectually protected this portion from further erosion and is still in good condition. In addition to this there was a row of piles 6 feet apart driven on the top of the bank a short distance back from the edge

(Ex 114C p 2849)

with the view to catching drift and checking the velocity of the water when it reached the overflow stage, the idea of this being to assimilate the conditions existing before the trees and underbrush were cut away. The effect of the high water of February, 1890, upon this and the resulting scouring action of the water in its immedi-

ate vicinity, were not such as to warrant the further construction of works of this character. Above the upper end of the reveted portion of the bank there is a hard gravel beach for a distance of about 1,400 feet. This extends back from low water from 50 to 100 feet; then comes the bluff soil bank from 8 to 10 feet high, eroded more or less at high water. In this locality is the head of a low place in the land through which the water flows at ordinary high stages. Above this for a considerable distance the same gravel bed seems to underlie the bluff bank and protect it from erosion except at the higher stages of water. The profile along this low swale shows that the water commences running through it at a 10-foot stage. At that stage the water is 2½ feet above the top of the bank across the lower end of the slough and is backed up to within about 1,700 feet of the point of overflow at the upper end. The fall is then 10 feet. At the low-water stage the surface of the water in the river is on a level with a point 3,500 feet below the head of the swale. This seems to be filled about the head with course heavy material brought in during high water. The evidence that this is enlarging or growing deeper is not conclusive.

The total amount expended by the United States in protecting this bend was $12,496.

From a study of the results of this survey and a personal visit to the ground during high water and again at low water, I can not conclude that there is any dan-

ger that the channel of the river at low water will pass over this neck within any reasonable time in the future, or that the city of Corvallis will be deprived of its advantage of water transportation. At high stages of the river the water will continue to pass over these bottom lands as it has done in the past, and no amount of money within reason will prevent it.

The present condition of the river in this vicinity as regards navigation may be classed as very good when compared with many other localities along its course where no improvement is contemplated.

In the first bend above Corvallis we find the lower end of a chute that leads across a narrow neck to the river above. The length of this is 3,600 feet. At a 5-foot stage the water commences to run through this chute. The difference of level in the river at this stage between the head and foot of the chute is 8 feet. It is at present very much obstructed with fallen trees and driftwood. If this were cleared out and the trees and underbrush along its banks cut down for some distance back, it would gradually enlarge and serve as an escape during ordinary high stages for a large portion of the water that now passes down around the bend and over the bottom land in front of Corvallis. This fall of 8 feet in a distance of 3,000 feet will give a very swift current through the chute when it is cleared of the obstructions that now encumber it. The sand and gravel at its head may be expected to be washed away and in time the

low-water flow of the river may take this course. This will produce a radical change in the regimen of the river in this vicinity and give great relief to the bend below. Navigation during the low-water stages will probably not be so convenient when this takes place as at present, but in time as the head of the slope is washed down it will be less steep and the velocity of the water diminished.

(Ex 114C p 2850)

To the extent of clearing out this chute as indicated above I recommend that work be done in this locality, and estimate the cost of the improvement at $5,000.

Very respectfully, your obedient servant.

THOS. H. HANDBURY,

Major, Corps of Engineers.

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STATE'S EXHIBIT 115

|Certificate omitted in printing|

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ANNUAL REPORT
OF THE
CHIEF OF ENGINEERS
TO THE
SECRETARY OF WAR
FOR
THE YEAR 1875.

IN TWO PARTS.

PART II.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1875.

(Pages 760 through 768)

G G 2.

IMPROVEMENT OF THE WILLAMETTE RIVER ABOVE OREGON CITY, OREGON.

The report in regard to this improvement for the fiscal year ending the 30th of June, 1875, is respectfully submitted. The operations consisted in the removal of snags, roots, rocks, and overhanging limbs of trees, with such other obstructions to the navigation of the river as were deemed necessary. These were all executed by

the United States snagboat, manned by a master and a crew of seven men under the employ of the Government. In a great many cases giant-powder was successfully used in blowing to pieces and loosening such snags as were deeply embedded in the gravel or sand, and which resisted the power of the boat. She was amply supplied with the usual mechanical appliances of derricks, capstans, gearing-tackle, and a full assortment of all necessary tools for the performance of the work. The machinery was worked by hand. The boat was either warped from point to point at the scene of her labors, or between distant points was towed by the steamboats plying regularly on the river. As the appropriation for the fiscal year was so very limited, no additional improvements could be attempted with a view to deepen the bed at many points where bars and elbows exist, by either the dredging process or by the construction of wing-dams, or by longitudinal dikes for the establishment of uniform channels, made of continuous piles, backed by heavy timbers. Many useless sloughs, however, were closed by cutting trees across them, and damming them by floating drift, in order to increase the volume of water in the main channel. The following is a brief synopsis of the work performed, prepared from the monthly reports for the year:

1874. *July.*—Snag-boat, after being thoroughly calked and painted, was towed to Jarvis' Slough on the 15th of July. Thirty snags were removed at this place, many

of them by the aid of giant-powder, averaging from 30 to 150 feet in length and from 1 to 5 feet in diameter.

August.—Snag-boat still continued to work at Jarvis' Slough for a time, and during the remainder of the month opposite to Wheatland. Fifty snags and stumps were taken out, at an average of 75 feet in length by 6 in diameter. Many of these trees were so long that it became, in many instances, necessary to saw and cut them into from four to nine pieces. Giant-powder was found to be indispensable for the removal of stumps where firmly embedded, which was frequently the case in the bottom of the river, and considered dangerous obstructions to navigation.

September.—Snag-boat was engaged between the 1st and 12th of the month in removing snags, stumps, and rocks from the following localities: Gate's Bar, Jackson's Warehouse, Five Islands, Davidson's Landing, and Champoeg. Seventeen snags and stumps were removed from these several places, their total length being over 1,000 feet, with an average of 7 at the butt. This being completed, operations were commenced at Rock Island on the 13th. Capstan was repaired and drills sharpened. Floating stage was also prepared and work begun on the rocks. A bowlder among the Taulitan rocks, 6 feet in diameter, was also blasted and displaced from the channel.

October.—From the 1st to the 14th of the month the snag-boat remained at Ash Island, removing forty-two

snags, ranging from 20 to 200 feet in length and in diameter from 1 to 4½ feet. Thence she was towed to Carey's Bend, where she lay until the 20th, displacing twenty-

(Ex 115, p 761)

two snags of from 20 to 90 feet, some of which were deeply embedded in the gravel, and consequently very difficult to remove. On that day she reached Weston Bend and took out thirty more; it was there necessary to use the powder. On the 27th she arrived at Bennett's Dread; at this place three large stumps were blasted to pieces, and twelve trees cut down from off the land which raked the cabins of passing steamers as they hugged the banks to avoid the currents. The boat was then dropped down to Chrisman's Bar, where eight snags were pulled out.

November.—Work was continued at the same locality for a few days. Thence the boat was temporarily dispatched to the mouth of the river to remove some dangerous snags which had lodged across the only channel for ocean-steamers and sailing-vessels. She arrived there on the 7th, and continued operations until the 25th. Subsequently, a very long snag was dragged out and cut to pieces from the channel and anchorage in front of Portland.

Thirty-two large trees and stumps were removed from the mouth; of the former the largest was 180 feet in length and 16 feet in circumference at the butt. The boat was then towed to Canemah, about two miles above

Oregon City, at the falls of the Willamette, where she was temporarily laid up for the winter and the crew discharged.

December.—No work accomplished on account of high water in the river. During this freshet many new snags became lodged in the channel, rendering navigation dangerous and difficult.

1875, *January.*—Operations were still suspended for the same cause. The steamers Shoshone and Albany were snagged, and nothing but the machinery saved from the wrecks. On the 2d of the month, the following report was rendered by Capt. James Wilson, pilot of the Governor Grover, as to the localities and numbers of snags which had lodged in some of the most dangerous places during the winter high waters:

	Snags		Snags
At Ash Island	4	Turntable	8
Weston	1	Peoria	5
Bennett's Dread	1	Mouth of Long Tom	4
Five Islands	2	Eagle Bend	1
Mouth of Danger Slough	1	Corcovan Root	5
Bitterman's Bend	9	Hamilton Warehouse	2
Buena Vista	6	Irish Bend	6
Spring Hill	3	Monroe Landing	10
Between Albany and Corvallis	15	Spelling's Fish Bend	6
Mouth of East Channel	5	Elfin's Chute	5
Booneville Slough	12	Harrisburg Bend	12
Raft snags	4	Total	127

Between Harrisburg and Eugene City they were too numerous to count.

February.—On the 8th of the month the crew of the snag-boat was again shipped.

On the 9th and 10th she was towed by one of the

river-steamers to Salem, to attempt the removal of a large snag near that place, the same upon which the Shoshone had been sunk a few weeks before. On the 11th she worked with success in pulling it out, but the steamer proved to be too badly damaged to attempt to do anything for her in the way of repairs and she was consequently abandoned, after her machinery had been removed. On the 12th, the snag-boat was towed up past Albany to Magoogalon's Slough, where four snags of the usual dimensions were displaced. Subsequently she was taken up on the 13th, and commenced operations at the mouth of Booneville Slough, four miles above Corvallis. At this locality, during the remainder of the

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month, one hundred and ninety-three snags, from 150 to 30 feet in length, the majority of them very long, were removed, cut up, and thrown on the bank, completely out of the way, on account of the narrowness of the channel; it is two miles long, and full of obstructions throughout its entire length.

March.—The snag-boat continued operations at Booneville Slough until the 8th of this month, during that time disposing of thirty additional snags. On the 9th, she was taken up to Turntable, at the head of Big Island. This is a peculiar elbow, where the channel takes a sudden bend; a boat in descending at high water, first runs into the righthand channel for a short distance, then, after making a complete rotation, shoots back into

the left one before resuming its course. Forty-eight snags were pulled, all averaging about the same dimensions as at previous places. On the 20th, the snag-boat arrived at Peoria; at this place seventeen snags were taken out from a new chute, which has been used by steamboats since the closing of the east channel. Many overhanging trees were cut down. On the 25th, she reached Wilson's Chute. On account of a rapid rise in the river at this time, the water assumed a very muddy appearance, and it became impossible to see the snags. The masses of drift from above also endangered the boat so that her position had to be shifted to secure her safety. Very little work was, in consequence, accomplished at this place; it was found necessary to postpone it until a more favorable time should offer during the down trip. On the last day of the month the snag-boat was towed up to Harrisburg Bend.

April.—Operations were commenced soon after the beginning of the month; the boat had to be shifted often on account of drift-wood, much of which was caught and used for filling up the mouths of useless sloughs. In consequence of the rise in the river from the melting of the snow in the mountains, and the effect of the warm weather, which had been recently experienced, the work with the snag-boat was frequently suspended. On such occasions the men were engaged on a large drift formed at the head of Wilson's Slough—working, with the skiff, lines, axes, and saws, Spanish windlass, and

small tackle, by hand. During the month forty trees and stumps were removed at Harrisburg Bend from the small and large sloughs, and two hundred similar obstructions from the head of the chute. The deck of the boat and the sheers of the hoisting-apparatus were painted during the time she was not otherwise employed. On the 26th, she was lined up part of the way to Harrisburgh. The mouths of three sloughs near that place, which carried off a large body of water from the main channel, were filled with drift and closed.

May.—Work was continued at Harrisburg Bend for the first six days of this month, during which time twenty-six snags were removed—all that could be seen above the surface of the water. It was then necessary to suspend further operations, on account of high water and its muddy condition. It had commenced to rain very hard much earlier than was anticipated. Between the 24th and 29th, the master and crew were detached from the snag-boat and directed to assist the steamer Ohio in cutting her way through a drift-pile in a new chute, afterward known as the Ohio Chute, which the river had recently opened for itself. Between two sucessive trips of the steamer the old channel had become almost dry and useless, only one out of the many hundred freaks of the same nature caused by the velocity of the current receiving some sudden check from newly-accumulated drift or rafts. Upon returning to the snag-boat several more snags were removed, the water having become

clear and low. The river was found to be full of obstructions between Corvallis and Harrisburg, and its condition far worse between the latter place and Eugene City.

June.—On the 4th of this month the snag-boat drifted down to Ingram's Bend, and subsequently to Alpin's Chute, a mile below the former, and about the same distance above Wilson's. From these two localities one hundred and thirty-five obstructions were removed; stumps and snags from 180 to 30 feet in length, and in circumference from 4 to 19½ feet. A great portion of these were deeply imbedded in the center of the steamboat channel; oftentimes the entire bodies of the trees would be covered by gravel, with nothing but a single root standing erect to bid defiance to passing boats. A great deal of difficulty was experienced in getting hold and displacing them. During the last two months good work was accomplished; two new chutes, Alpin's and Wilson's, each about a mile in extent, had been opened, in addition to a great improvement effected in the sloughs at Harrisburg Bend. Steamers could no longer run the old river, from the many sudden changes in its channel, and which were constantly occurring; these works consequently became a necessity, whilst at the same time the distance was shortened about two miles.

The trunks of trees of which the snags are composed are principally cottonwood, maple, ash, and willow.

From the above monthly details some conclusions may be reached as to the amount and character of a certain class of work to be annually executed, as long as the banks remain so densely covered with timber and subject to the powerful effects produced by the great volumes of water which will seek an uninterrupted passage to the open sea. Before submitting, on the 22d of May, the project for the continued prosecution of the improvement of the Upper Willamette during the current year, it was found impracticable to make a careful and precise examination of that portion of the river which extends between Oregon City and Eugene City, and for which the appropriations of $25,000, in currency, by the act of Congress approved March 3, 1875, was specially intended. The unusually high stage and muddy appearance of the water precluded any intention of the kind, although anxiously desired. It had also been ascertained that many new chutes had been forcibly cut at many unexpected and undesirable points, and that serious departures had been effected from the channel of the previous year. The time had not been propitious for several months for the purpose of ascertaining the exact nature of the work to be accomplished. It was desirable to make an inspection at the lowest stage of water to view the river at its worst possible phases. The office was constantly advised by the master of the snag-boat as to its condition. On the last day of March the Willamette had risen 7 feet above low-water, the high-

est mark reached at any time during the four previous years—so high as to render it unsafe and risky to venture with the boat into the channel, owing to the number of floating logs and large trees displaced from the banks. The water was also so thick with mud as to render it impossible to discern the positions of snags below its surface. Its appearance indicated that great damage must have been done by the washing away of the banks at points on the upper river. It was not before the week commencing on the 6th of June that all the conditions of low, clear water and suitable light-draught steamboats between intermediate points were favorable for a detailed examination in person of the regimen of the river. The ascent was necessarily slow, and the trip almost entirely performed by daylight, so that, through the politeness and knowledge of intelli-

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gent pilots, the nature of the obstructions to navigation were made plainly discernible; the extent, depth, and general character of the many bars and shoals; the localities where generally occur the lodgments of rafts, drift, snags, stumps, and roots during each successive annular winters-freshet; the positions of ledges of rocks and bowlders—all were made apparent, and a proper understanding and appreciation of the necessity of the improvements was attained by an actual observance and study of the subject, made under the most favorable circumstances. The result of this reconnaissance was the

preparation of a project for the further prosecution of the works of improvement on the Upper Willamette, confirmatory to a great extent of the one previously submitted. It comprises not only the specifications for the construction of wing-dams or longitudinal dikes, for narrowing, deepening, and rendering more uniform the channel, and at what particular localities, but also the displacement of such ledges of rock and bowlders as may be found to interfere with the safe passage of boats. For these specific purposes the larger portion of the appropriation will be allotted; the balance will be partly retained for the payment of the salaries of the assistant engineer in charge of the survey of the river, also of the location of the lines of work, and of his special party of subassistants, rodmen, flagmen, boatmen, and employes generally; for the employment of master and crew of the snag-boat engaged in the removal of snags, sawyers, stumps, and roots from the channel, and all incidental expenses relating to its repairs and its intended use; for the cost of material and supplies; for the purchase of small boats; for the rent of office; and for the employment of a superintendent of construction during the progress of the work, whose duty it will be to see that the contractors strictly and faithfully conform to each and all of the requirements of the specifications. It was recommended by this office, and authority subsequently granted by the Chief of Engineers for the purchase, that more suitable hoisting-apparatus be erected

on the snag-boat, comprising the necessary machinery, engine, and boiler, and also two capstans, with all gearing, shifting-levers, and connections, to be run by steam-power. It is estimated that more than double the amount of work can be accomplished in the same length of time that can be effected with the present slow process by manual labor. The engine will be a portable horizontal one, on an iron bed, with vertical boiler. The plan is for two capstans, which can be used either in hoisting or hauling the boat to and from position, or for lining up her up stream. The additional expense is nothing, consisting only in the employment of an engineer with an increased pay per month, compensated by the reduction in numbers of the old crew. Fuel is always readily to be had for the cutting. The usual expense of towage will have to be taken from the appropriation when necessary to move the snag-boat between distant localities, although the Willamette River Transportation Company have kindly offered, on different occasions, to attend her free from charge. The number of obstructions to be displaced cannot even be approximately ascertained, and consequently no direct contract could be judiciously made to meet the entire and constantly-changing features of the case. Even at this time it is not known what obstacles of that nature will have to be removed; and certainly there is no foretelling what may be required of the snag-boat after the occurrence of the annual freshets during the current fiscal year. The amounts to be re-

tained, as far as practicable, for the previously-enumerated cases, must be especially and solely assigned for those objects. The major part of the appropriation, as before stated, will be applied to the construction of suitable wing-dams or longitudinal dikes at the several lo-

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calities where most needed, and in order to narrow and thereby obtain a greater depth of water and a more uniform steamboat-channel of the river. At the points where the work is to be executed, the bed of the stream becomes g e n e r a l l y very considerably widened out. There bars of gravel and sand are formed, which, at the time of an extremely low stage, are covered with but little water; in many instances not more than from 17 to 20 inches. This condition of affairs continues from about the 1st of July until the commencement, in the latter part of October, of the rainy season. Whilst making the examination of the river, between the 7th and 11th of June, both inclusive, the water at the time being very near its lowest stage, a great many rapids were passed between Oregon City and Corvallis, and the steamer Governor Grover often scraped the bottom on account of the shallowness of the stream. Between Corvallis and Eugene there were many more, upon which even the "Ohio," carrying about seventy tons, would occasionally stick, or drag very heavily over them. The latter was built to draw but 12 inches; but, being a propeller, drew, when moving, several more.

The localities of the dams and the section from which snags and other obstructions will have to be removed, extend along the river from Oregon City, at the Falls of the Willamette, to Eugene City, a distance approximately estimated, in the absence of actual measurements, to be nearly one hundred and ninety-five miles. The last-named place has been usually considered the head of steam-navigation for light-draught boats during average stages of high water, and only continuing for a few months of each year. Boats have ascended as high up as Springfield, some six miles above Eugene. The names of the localities along the river, at most of which it is proposed to confine operations for the current fiscal year, have been placed in a tabulated form. In this table the intermediate distances are given, the probable length of dams at each, and the places where the displacement of rock must be effected, together with such remarks as may be applicable to the subject, placed in a condensed form, and briefly descriptive of the character of the most dangerous difficulties to be overcome.

The estimate prepared and submitted in regard to the work to be performed during the current fiscal year was based upon personal examinations, and reliable information; and upon this representation the appropriation of $25,000 was made for the improvement of the channel. It was at the time intended that the construction of wing-dams should be confined to that portion of

the river between Oregon City and Corvallis, in addition to the removal of snags and other obstructions along the entire distance between the first named and Eugene City. Since then, after more extended examinations, no good reason has become apparent to justify a change in the plan then decided upon; on the contrary, the opinion then entertained is strongly confirmed. As the Willamette above Corvallis is cut up into so many useless sloughs, and at each liable to undergo very marked and frequent changes, it would be impossible to confine its waters in one main and permanent bed. New channels are not unfrequently cut out and old ones have been left nearly bare; the latter, after being closed for years are again reopened. The yielding nature of the soil cannot resist the action of the strong currents which strike the banks. The latter are low, composed of fine gravel overtopped with alluvial soil, and although covered with timber and thick brush to the water's edge, are easily washed out, or cut through as if they possessed only the consistency of sand. The river above Corvallis is very tortuous, at places very narrow, and runs at many localities with great rapidity. Only two large tributaries empty into the river below

Harrisburg, the Mary's River immediately above Corvallis and the Long Tom above Peoria. The river has but recently left its old bed and made a cut across a neck of land into the Long Tom, using the bed of the latter

stream in place of its natural one. Such changes are only too frequent. Three other streams—the McKenzie, the Middle, and the Coast Fork—unite below Eugene City, and form the main body of the river. The principal obstructions to navigation are found between Eugene City and Harrisburg, a distance of twenty-eight miles by the river. Between these two points there are eleven bars with from 10 to 12 inches of water at the lowest stage; wherever they exist the river is divided into two or more channels of about equal capacity, from 100 to 200 feet in width, and from 2 to 4 in depth. The bars extend entirely across the river. The volume of water is sufficient, if confined within one channel, to float boats of 3 feet draught at all seasons of the year. The fall is uniform, the only changes in the velocity being found on the bars, which are invariably near the head of the sloughs. Through the latter nearly, if not quite, one-half of the water is dispersed. The adjacent country, as well as the banks, is flat, from 5 to 8 feet above the line of low water; the river-bottom is from one to two miles in width, and the soil is nothing more than a bed of gravel of unknown depth, with a surface-layer of sandy loam from 1 to 3 feet in thickness. The timber, consisting of cottonwood, or Balm of Gilead, maple, ash, alder, and willows, is dense, and covers the whole bottom-land. The latter is traversed by sloughs and bayous, large and small; and in times of floods is covered with swiftly-running water to a depth of from 5 to 10 feet.

Several farms have been inundated and washed away, the river entirely devastating them by cutting a network of sloughs through their broad fields; the farmer along its banks cannot tell at what time his hundreds of acres may be swamped and disappear from his sight forever. Each year new channels are opened, old ones closed; new chutes cut, old ones obstructed by masses of drift; sloughs become the main bed, while the latter assume the characteristics of the former; extensive rafts are piled up by one freshet only to be displaced by a succeeding one; the formation of islands and bars is in constant progress where the velocity of the current receives a sudden check only to disappear at the very next high water. Captain Miller, one of the oldest and most experienced pilots in shoal waters of the same nature as the Willamette, has stated that he has never run the same channel for two consecutive years between Harrisburg and Eugene City. The map of the river, compiled from surveys made from fifteen to twenty years ago, a tracing of which is transmitted with this report, differs so widely from the present meanderings of the channel and its many sloughs along that section of the river to which reference is made, as to be of very little use in an examination for the purpose of projecting or devising a plan of permanent improvement. If any attempt of the kind should ever be made, it must be at an enormous expense of time and money; the small appropriations annually contributed for the purpose of

meeting the immediate exigencies of the case would soon be swallowed up in the whirlpools and eddies created by the rushing waters of the winter freshets. Even in the lower portions of the river it may prove a difficult matter at many points to construct wing-dams, on account of the great velocity of the water, and the temporary formations of eddies, and the consequent undermining of the piles during the progress of the work. Crib-work may then have to be substituted for piling. The only feasible and sensible plan in this case is the annual removal, by the snag-boat, of the snags and other obstructions, as they are brought down from above and

lodged on the bottom; together with the additional work of filling up as far as possible the heads of all useless sloughs. "Most rivers acquire in time a fixed regimen, although periodically, and sometimes accidentally, subject to changes from freshets caused by the melting of snow and heavy falls of rain." In the particular case under consideration it will be many years before any permanency can be effected; not until the dense growth of timber disappears from the banks, the cause of all the difficulties to be contended with even in the best-devised system of improvement, can any real and permanent good be accomplished. As an instance of the nature and suddenness of the changes in the Willamette between Harrisburgh and Eugene City, the following may be furnished as a fair illustration: The pilot and master

of the steamer Ohio, after having made but two favorable trips to the latter place during the first part of May, reported at the time to this office that "since the last one was successfully made," to quote his own expression, "our river has left Eugene." In other words, that, at a point about ten miles above Harrisburgh, the channel, facetiously styled by the pilots the "Grave-yard," the original old bed of the river which had been run for fifteen years, had become so low in the course of a few days as to be no longer navigable, even for that steamer with her very light draught; this too, at a time when she was favored with a high stage of water. It is six miles in extent, very narrow, crooked, and rapid. This condition of affairs had been occasioned by the river forcing for itself a new cut through a narrow strip of land, opening a chute six hundred feet in length and about forty feet in width at its narrowest place, clear of drift, with a fall in that distance of 3 feet, and nearly straight. A large raft had been lodged at the upper end of it, which impeded its passage.

The master of the snag-boat was directed to move at once, with a portion of his crew, to the obstruction, in order, with the assistance of the steamer's crew, to break it up and remove it from the channel. This was successfully accomplished between the 26th and 28th of May inclusive, during which time about twenty-two hours' work was performed. In consequence of the great fall, boats will have to be warped up and down. It has

been named the "Ohio Chute;" the distance saved by running it cannot be less than three miles. Subsequently, within a very short time after the first removing of the raft, and whilst making a personal inspection, the cut was found to have considerably changed by the washing away of the banks and the deposit of additional snags and stumps. The precaution had been taken to again carry up the master and part of the crew of the snagboat, with the necessary tools and a supply of giant-powder, to the scene of their previous labors, and it was fortunate that such a step had been taken. Another detention of seven hours occurred in the attempted removal of snags by the "Ohio;" but success only attended the application of a charge of the powder, by which they were displaced sufficiently to allow the boat to be lined past them. On her downward trip still another detention of several hours took place. Only two satisfactory results were obtained by the experience of this trip: In the first place, that a steamer of her build does not have the necessary stiffness for work of that class; nor is she possessed of sufficient power and the needed hoisting-apparatus to drag out or raise up, and then throw completely out over the bank, any snags of large dimensions to which she might tackle. In the second place, most of them cannot be pulled straight out by mere force, as the roots are generally so deeply embedded in the bottom; but the latter must be first loosened by blasting, and the trunk be then raised up and hoisted out perfectly

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clear of the water, and afterwards cut into several pieces, so as not to again become an impediment in the channel. The case alluded to fully demonstrates the very sudden changes in the channel of the river; an old one used for many years suddenly becomes useless even at an unusually high stage of water; and a new one is opened, which has to be improved upon during each attempted trial of the boat to make the ascent, and then without any certainty of a successful or even a partially durable result. There can be no longer any doubt as to the fruitlessness of experimenting for the present upon any so-called permanent improvement along that portion of the river between Corvallis and Eugene City. The former place is scarcely out of sight before the difficulties commence; the river almost immediately above the town divides into two principal channels, known as the East and West Channels. The latter is the one now navigated, but the other is said to have plenty of water, requiring only the removal of snags and drift.

It will be ascertained whether it cannot be made navigable and useful, as it is shorter than the other by from two to three miles. No large rapid was found to exist, either by one of the assistant engineers of this office, Mr. Robert A. Habersham, who was directed to make an examination of the river, and from whose notes upon the same many items of useful information have been abstracted and incorporated in this report, or by the of-

ficer in charge during his personal reconnaissance made at a later period. The river appears along that section to be almost a continuous series of rapids, connected here and there by short, smooth sheets of water. All that can be done in the furtherance of any improvement will be to remove as rapidly, and as far as possible, according to the means at the disposal of the office, all such obstructions, of whatever nature they may prove to be, as will be encountered in any one of the new channels which the river shall in future be forced to make for itself. The construction of the wing-dams must, from necessity, be commenced at the lowest bars, along that section of the river more immediately above the falls, between Oregon City and Salem, to be continued thence up and along it to each of the several other points in their regular order of succession, preference always being given to those places where the channel contains the least depth of water and where the work is most needed. It would be useless to attempt anything in the upper portion of the river before the lower section has received attention. The great necessity of improving the upper river above Albany is very readily conceded, but it must not, however, be forgotten that to render any such improvements beneficial, if accomplished, it will be most important and necessary to attend to some other and very needed works lower down than that place. Lone Tree Rapid and Union Bar, below Salem, are known to be much worse obstructions than any others to be encountered in the river; from 17 to 18 inches can only be carried over them at low-water. These will, of course, have to be improved first, otherwise any contemplated works further up the stream need not be attempted. Already the greatest difficulty opposed to the navigation of the Upper Willamette, along its entire length, has been successfully overcome. A company, aided by the State, have built a canal and locks at the falls opposite to Oregon City, enabling boats to pass up and down without difficulty.

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ANNUAL REPORT
OF THE
CHIEF OF ENGINEERS
TO THE
SECRETARY OF WAR
FOR THE
YEAR 1876.

IN THREE PARTS.

PART II.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1876.

(Pages 654 through 657)

F F II.

IMPROVEMENT OF THE UPPER WILLAMETTE RIVER, OREGON.

GENERAL DESCRIPTION OF THE RIVER.

The Willamette River rises in the Cascade range about 100 miles south of its junction with the Columbia, and cuts its way through a post-pliocene clay, in which are found remains of horse, mastodon, &c. Its important tributaries are the McKenzie and Coast Forks, the Long Tom Santiam, Mary's, Calapooya, Lackamute, Pudding, Yamhill, Tualatin, and Clackamas rivers. Its drainage-basin, including the watershed of its tributaries,

comprises an area of not less than 12,000 square miles.

The river-bottom is covered generally with heavy timber, principally cottonwood, maple, and ash, with thick undergrowth reaching to the edge of the high-water channel. Small tracts of cultivated land appear at intervals on the immediate banks, the houses of the settlers being situated generally a short distance back.

The bed of the river at its medium stage varies in width from 400 to 2,000 feet. During low water about one-half of its area is occupied by bare gravel-beds, covered in part by willow thickets, while the waterway varies in width from 150 to 1,000 feet. The depth at low water in the upper reaches of the river, above Corvallis, is from 12 inches to 12 feet; in the lower portion from 3 to 20 feet, while the width below Corvallis remains nearly the same throughout the year.

The steamboat channel, usually about one-fourth the width of the river, runs from side to side. The banks are generally vertical, from 5 to 10 feet and sometimes 20 feet high, and are of an alluvium formation. Rock occurs at some points. The bottom is gravelly, generally loose, but in some places cemented into hard-pan. Underlying the gravel, at depths varying with the localities, is the basalt common to this section of the country. As an obstruction this rock crops out at Rocky Rapids, Humphrey's Rocks, Eola Rocks, and Oregon City. It is easily drilled, blasts well, and is of good quality for masonry.

FLOODS.

The floods of the Willamette are caused by the rains, which occur between October and June. During their continuance the river maintains an average height of 10 feet above low-water mark. Excessive floods are rare, the highest recorded attaining a height of 30 feet above low-water mark.

At the commencement of the dry season, usually in May or June, the water begins to abate; falling rapidly at first, then more slowly, until it reaches the mean low stage, two months later.

Occasional heavy rains in the Cascade range maintain it at this stage until the beginning of the next rainy season; but should the summer be dry, as is generally the case, the water continues to fall, and reaches its extreme low stage about the month of August. No further change takes place until the winter-rain commences, which is usually in the latter part of October. The water during the lowest stage is very clear. At all other times it carries a considerable quantity of earthy matter. A portion of this is deposited in the deep reaches of the river, many of which, several miles in length, occur in the lower section, but the remainder is spread over the low bottom-lands, or transported to

(Ex 115, p 655)

the portion of the river below Portland, and deposited on the bars there, or discharged into the Columbia.

In the upper section of the river very little sediment is deposited, owing to the great velocity of the current.

HEAD OF NAVIGATION.

Eugene City, 172 miles from Portland, is the head of steamboat navigation on the Willamette. Boats drawing 30 inches loaded can now ply between Portland and Salem, a distance of 70 miles, at all stages of the river: between Salem and Corvallis, a distance of 44½ miles, at all times, except during very low water, or from November until July; and between Corvallis and Eugene City, a distance of 57½ miles, during the winter and spring rise, which generally lasts about six months. From Eugene City to Springfield, 6 miles above, occasional trips have been made during high water, but the total number accomplished thus far, I am informed, does not exceed ten.

For the further discussion of the river, we shall divide it into two sections.

1.—THE UPPER SECTION, FROM EUGENE TO CORVALLIS.

From Eugene City to Harrisburg, a distance of 23½ miles, the river falls 105.9 feet, or at the rate of 4½ feet per mile; below Harrisburg no levels have yet been taken, but from this point the rate of fall diminishes gradually and with tolerable uniformity to Oregon City, where a fall occurs of 41 feet in three-quarters of a mile. A canal with 4 locks was constructed here three years ago.

Between Eugene City and Corvallis the changes in the river, even within the last 20 years, have been very great, and river-pilots say that, in reaches from 5 to 10 miles in length, above Harrisburg, they have never run the same continuous channel for two consecutive seasons. The Willamette, in this section, receives but one tributary that affects its flow, namely, the McKenzie Fork, which enters it 9 miles below Eugene, and increases its volume about one-half. At several points above Corvallis, the river separates into two or more channels, and in one locality, known as the Devil's Graveyard, there are, besides two principal channels of nearly equal capacity, not less than 20 sloughs with running water. The result is, that for a distance of 25 miles the capacity of the river is reduced one-half, while the remainder of this section, about 32 miles, is much obstructed by bars and shoals, there being 30 in all between Eugene City and Corvallis, 26 of which are located above Harrisburg. These bars, composed of loose gravel, are constantly changing their form from the action of the current. Where the velocity is the greatest, pebbles from one-half to one inch in diameter have been observed on the crests of the bars moving down-stream at the rate of from 1 to 3 feet per minute, and during the survey last summer, the water being low, alterations thus produced in the shape of the bars were perceptible from day to day. This was at the lowest stage of the river; and as the same process goes on more rapidly during the

high stages, it is evident that maps showing the shapes of these bars would be of little value, when finished, in determining a plan of improvement.

The water in the river is sufficient, if controlled, to afford a channel for boats drawing 30 inches during at least eight months of the year—that is, at all times except during the lowest stage.

To do this it will be necessary to cut off all sloughs, and to confine

(Ex 115, p 656)

the river in the main bed. This can be done by proper dikes and dams, the materials for which are found in abundance in the vicinity.

The localities where the greatest waste of water occurs, and which should be first cut off, are as follows, proceeding from Eugene toward Corvallis: White's Rapids, Sawmill Bend, Trout Bar, Ohio Chute, Bromley's Bend, Alford's Chute, Wilson's Chute, Peoria, and Turntable.

Dams should be located at each of these places, and not more than 5 feet above low-water mark. It is not desirable to attempt to control the water after it has reached this height. The total length of the dams required for these sloughs will be about 6,000 feet. The further improvement of this section of the river will consist of building wing-dams near the bars, 20 in number, the unstable nature of which bars is such that no accurate estimate can be made of the cost. An approximate

estimate of the total length of the dams required will be about 9,000 feet. The approximate estimate of the cost of the improvement of the river, so as to obtain a depth of 30 inches between Eugene and Cornwallis (sic) during the ordinary stages of the river, or for at least eight months of the year, is as follows:

6,000 feet of cut-off dams, at $3	$18,000
9,000 feet of wing-dams, at $2	18,000
Contingencies, superintendence, engineering, &c., 10 per cent	3,600
Total	39,600

In addition to these troubles snags and drift-logs are numerous, and each high water adds to their number. Annual appropriations will be required to remove these, and will continue to be necessary until the axe of the settler or the erosion by freshets shall have removed the timber from the banks of the river.

The continual changes that are occurring render it almost impossible to prepare and submit a plan for the permanent improvement of this section of the river.

Up to this time the only work done above Corvallis consists of the removal of drift and snags at different points, the greater portion having been taken from Booneville slough, Peoria; mouth of the Long Tom,, Wilson's and Ohio Chutes, and Harrisburg bend.

2.—THE LOWER SECTION, FROM CORVALLIS TO PORTLAND.

Below Corvallis the general direction of the channel has not changed materially within a number of years. Boats drawing 30 inches loaded, owing to recent improvements, can ply between Portland and Salem at all seasons of the year, and between Salem and Corvallis at all times except during low water.

The difficulties in the way of navigation consist of numerous bars, some rock, and accumulations of drift and snags. Of these bars there are nine between Portland and Salem and 15 between Salem and Corvallis. Some of these can no longer be classed as obstructions, having been improved artificially or by changes in the bed of the river, but they are liable during any one season to return to their former condition, owing to the loose nature of the material of which they are composed.

During the summer of 1875 a survey of the river was made from Albany to Salem, and examinations made of the various bars in the remainder of the section under consideration. No survey has ever been made between Corvallis and Albany or between Salem and Portland, but the latter portion will be surveyed during the low-water season of 1876.

The following table exhibits the condition of the section between

(Ex 115, p 657)

Portland and Corvallis as near as can be obtained from the data at hand, the river having been too high since I have been in charge for careful personal examination.

* * * * *

Further careful examination must be made during

low water in July and August, 1876, and the survey of the river between Salem and Portland must be completed. Upon the result of this survey will depend the work to be done, and until it is made no definite estimate for the entire improvement of this section can be made. It is hoped that a depth of at least 3 feet can be obtained throughout the low-water season.

* * * * *

MEMORANDUM OPINION OF BENTON COUNTY CIRCUIT COURT

No. 21512—May 25, 1972

IN THE CIRCUIT COURT

OF THE STATE OF OREGON

FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff, vs. CORVALLIS SAND AND GRAVEL COMPANY, an Oregon Corporation, Defendant.	)	No. 21512
	)	MEMORANDUM OPINION

This action was tried before the Court without jury on October 11, 1972. Leave was given each party to file proposed findings and written argument in lieu of closing arguments. The Court has considered the written materials submitted by the respective parties and has reviewed the evidence, and briefs submitted. The Court now finds as follows:

1. Defendant's Motion heard and argued on May 12, 1972, asking the Court to reconsider its previous rulings on pleadings is denied.

2. The State of Oregon acquired title to all lands within its borders lying between the ordinary high water mark and the ordinary low water mark of all navigable streams when it was admitted to the Union. Private ownership of the lands lying between the

> high and low water marks oi the Willamette River, must therefore be by grant from the State of Oregon. This acquisition of title by the State was by virtue of the State's soverignity [sic]. These lands cannot be sold, or otherwise disposed of, by the State so as to prevent their use by the public of the navigable waters for navigation and fishing. *Corvallis Sand and Gravel Company vs. Land Board* 250 Or 319, 333.

The ownership if any of the Defendant in these lands must therefore be traced to a conveyance, or its equivalent, from the State of Oregon. Ownership in the State is presumed to continue until the State is shown to have parted with its title. *State v. McVey,* 168 Or 337 345.

The Defendant did not acquire title by adverse possession or laches against the State. *Corvallis Sand and Gravel vs. Land Board,* supra. The evidence does not establish title to the lands by conveyance from the State.

The Defendant claims title to some of the lands under the Laws of 1874, p. 76, Sec. 1, which provided that title of the State to tide and overflow lands upon the Willamette River was granted to the owners of the adjacent lands. The act was repealed effective October 18, 1878. "Owners" as used in this statute refers to the grantees of the United States and their successors in interest. The 1874 statute did not grant or confirm title in the United States government to any parts of the beds of navigable waters in the State. *State v. McVey* Supra, 356.

Defendant's predecessor in title, entered upon Government Lots 9, 10 and 12 of Sec. 12, T12S, R5W, on March 12, 1875. He was entitled to a patent on July 8, 1880. The patent was received April 10, 1882. Defendant's predecessor in interest did not become an "owner" within the meaning of the 1874 statute before its repeal in 1878, nor did his patent convey to him any parts of the bed of the Willamette River.

Parcel 1

Defendant makes no claim to that portion of Parcel 1 which is located from the line described in "number one" on page 11 of Defendant's third amended answer. The line starts at the approximate southwest corner of Lot 10.

Prior to removal by dredging of large quantities of rock and gravel by a railroad in 1913, a large portion of what is described as Parcel 1 consisted of a formation known as Avery Bar. The Defendant alleges that Avery Bar was a point bar accretion to lands of which he is the grantee, to-wit, government Lots 10 and 11. The Court finds that this portion of the bed of the Willamette River is not a part of the Fischer Cut hereinafter to be discussed. The Court further finds that although Avery Bar originated as an island, it subsequently, but prior to 1913 by accretion became a point bar joined to the uplands. The Court finds that the accretion first joined the uplands at the ordinary low water mark, and that

the point bar then developed on top of the joinder. The State owned from the ordinary high water mark to the ordinary low water mark. The point bar, known as Avery's Bar accreted to land owned by the State. Parcel 1 therefore belongs to the Plaintiff.

Parcel 2 A, B, and C

The Court finds that the Willamette River was clearly coursing around Fischer Island, a peninsula-like formation, from 1853 to 1909. By 1890 a clearly discernible overflow channel over the neck of the peninsula had developed.

After a record flood on November 25, 1909, the Willamette River visibly changed its course from around Fischer Island to across its neck through Fischer Cut. In 1906 prior to the "break through" it was estimated that roughly one quarter of the flow of the river was carried through Fischer Cut which was dry at low water, or below the 5 foot stage, and carried only at intermediate or high stages of the river. In 1890, Fischer Cut would have had to be cleared of driftwood and willow growth before it could possibly accommodate the flow of the river. The Fischer Cut channel in 1906 was in practically the same location as it was in 1890.

During the period intervening 1890-1909 the high water overflow did not clear Fischer Cut and the river continued to flow around Fischers Island. The event

when the Willamette River broke through Fischer Cut during the flood of November 25, 1909, was an event of common community discussion and the complete change of course shortly after its occurrence was observed by creditable witnesses including retired Circuit Judge Fred McHenry. The final action of the river was sudden and of such great force and violence as to convert Fischer Cut into the main channel of the Willamette River.

The change in course was not gradual and imperceptible as would occur in accretion or reliction. This was a sudden, rapid, and violent change of course, avulsive in character. The Court finds that the change of the course of the Willamette River from around Fischer's Island to through Fischer's Cut was an avulsive change, and that Parcels 2A, 2B, and 2C are owned by defendant.

Parcel 3

The Court finds that the portion of Parcel 3 downstream from the confluence of East River (prior to 1909, the Willamette River), which courses in part around Fischer Island, as measured by a line extended from the low water mark of the confluence extended across the Willamette River, lies within the bed of the Willamette River, and that the River has coursed over this portion in substantially the same manner since 1853. The Court finds that this portion of Parcel 3 is owned by Plaintiff. Parcel 3 is a part of Lots 11 and 12, Section 1, which was

the subject of a patent prior to 1878. Defendant's predecessor in title under the 1874 Act was owner to the low water mark of the Willamette River as it coursed around Fischer's Island. That part of the Willamette River changed course in 1909 to Fischer's Cut, and the former bed of the Willamette River in now named East River. Defendant therefore is owner of that portion of Fischer Cut upstream from the confluence of East River below, or upstream, as measured by a line extended from the low water mark of the confluence extended across the Willamette River. The remainder of Parcel 3 is owned by the Plaintiff.

Parcel 4

The Court finds that a substantial part of Parcel 4 now under water was in the bed of the river below the low water marks prior to the construction of a wingdike in 1948. This accreted formation, whether it be an island or point bar joined to the upland, was formed upon the bed, or accreted and joined the upland beginning at the low water mark. In either event it became a part of the land owned by Plaintiff, that is, the bed of the river between high and low water marks. Thus it is not material to ownership whether the accreted mass became covered with water from whatsoever cause be it the wingdike or the dredging of Avery Bar by the railroad in 1913-14.

Parcel 5

The Court finds that Parcel 5 is in the bed of the River between the lines of high and low water and that the Defendant's predecessors in title acquired no right therein by the Act of 1874. Parcel 5 is owned by Plaintiff, to the extent that it lies below the high water mark.

Parcels 6 and 7

The Defendant's predecessors in title of Parcels 6 and 7 acquired no right therein by the Act of 1874. Further the Court finds that Parcels 6 and 7 are not within the avulsive channel of Fischer Cut. The ownership of Parcels 6 and 7, including Avery Bar, or the railroad bar, within the lines of high and low water is in the Plaintiff.

Parcel 8

The Court finds Parcel 8 to be a point bar, joined to the uplands above the low water mark, and that the uplands were patented during the effective period of the 1874 statute. The Court finds Defendant to be the owner of Parcel 8.

Parcel 9

Defendant makes no claim to Parcel 9.

HIGH AND LOW WATER MARK

The Court finds that the ordinary low water mark at the guage at the City of Corvallis Water Treatment Plant is 197.4 feet above mean sea level, and from this point downstream, the ordinary low water mark drops an average of .9 feet every one-quarter of a mile.

The Court finds that the ordinary high water mark beginning at the location of the guage of the Corvallis Water Treatment Plant is 207.4 feet above mean sea level and from this point downstream, the ordinary high water mark drops an average of .9 feet every one-quarter of a mile.

DAMAGES

The Court finds as follows:

1. Plaintiff is entitled to recover damages for the period of six years immediately preceding the filing of the original complaint herein, and to date.

2. The Defendant is not entitled to an offset for "avoidable consequences" or for failure to mitigate damages.

3. Plaintiff is entitled to damages at 12.5 cents per cubic yard of minerals removed, which the Court finds would have been a reasonable sum to be paid as royalty during the entire period of wrongful withholding.

4. Plaintiff is entitled to damages upon the total amount of minerals taken within the low-high water boundaries as established by this Court.

The Court finds as follows:

1. 574,000 cubic yards of minerals were removed from Parcel 1; 56,000 from Parcel 3, in addition to that covered by the lease; no material from Parcel 4; 9,000 from Parcel 5; 21,000 from Parcel 6; none from Parcel 7, for a grand total of 660,000 cubic yards.

2. That the Plaintiff is entitled to recover damag s of a total of $82,500.

3. The Court finds that the damages are unliqui-

dated and that Plaintiff is entitled to interest only from date of judgment.

Plaintiff may submit findings of facts and conclusions of law accordingly.

Dated this 25th day of May, 1972.

RICHARD MENGLER
Circuit Judge

TRIAL COURT'S FINDINGS OF FACT AND CONCLUSIONS OF LAW AND SUPPLEMENT TO COURT'S FINDINGS OF FACT AND CONCLUSIONS OF LAW

IN THE CIRCUIT COURT

OF THE STATE OF OREGON

FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board,	)	
Plaintiff,	)	No. 21512
v.	)	FINDINGS OF FACT AND
CORVALLIS SAND AND GRAVEL COMPANY, an Oregon Corporation,	)	CONCLUSIONS OF LAW
Defendant.	)	

A. **Finding of Fact**

The Willamette River was a navigable river at the time of Oregon's admission into the Union in 1859, and is now navigable, in that section of the river between its confluence with the Mary's River and upstream to the present site of the City of Corvallis Water Treatment Plant.

B. **Conclusions of Law**

The State of Oregon acquired title to all lands with-

in its borders lying between the ordinary high water mark and the ordinary low water mark of all navigable streams when it was admitted to the Union. This acquisition of title by the State was by virtue of the State's sovereignty. Private ownership of the lands lying between the high and low water marks of the Willamette River, must therefore be by grant from the State of Oregon. These lands cannot be sold or otherwise disposed of by the State so as to prevent their use by the public of the navigable waters for navigation and fishing.

The ownership, if any, of the Defendant in these lands must therefore be traced to a conveyance, or its equivalent, from the State of Oregon. Ownership in the State is presumed to continue until the State is shown to have parted with its title.

II.

A. **Finding of Fact**

Defendant did not acquire title to any of the property in dispute by a conveyance from the State of Oregon.

B. **Conclusion of Law**

The defendant could not acquire title as against the State of Oregon to any of the property in dispute by adverse possession or laches.

III.

A. **Finding of Fact**

Defendant's predecessor in title entered upon Government Lots 9, 10 and 12 of Sec. 12, T12S, R5W, on March 12, 1875. He became entitled to a patent from the United States on July 8, 1880. The patent was received April 10, 1882.

B. **Conclusion of Law**

Defendant's predecessor in interest did not become an "owner" of Government Lots 9, 10 and 12 within the meaning of laws 1874, p. 76, prior to the repeal of such law on October 18, 1878, by laws 1878, pp. 54-55, nor did his patent convey to him any part of the bed of the Willamette River.

IV.

A. **Finding of Fact**

1. Ordinary Low Water Mark

(a) The elevation of ordinary low water mark is 197.4 feet above mean sea level at the City of Corvallis Water Treatment Plant.

(b) From this point downstream the ordinary low water mark drops an average of 0.9 feet every one-quarter of a mile.

2. Ordinary High Water Mark

(a) The elevation of the ordinary high water mark is 207.4 feet above mean sea level at the City of Corvallis Water Treatment Plant.

(b) From this point downstream, the ordinary high water mark drops an average of 0.9 feet every one-quarter of a mile.

V.

Parcel 1

A. **Findings of Fact**

1. Parcel 1 lies between the present lines of ordinary low water with its upstream limits delineated by a line at right angles to the river and opposite the City of Corvallis Water Treatment Plant and its downstream limits coinciding with the upstream limits of Parcel 2A.

2. Defendant disclaims any interest in that portion of Parcel 1 upstream of a line commencing at the approximate southwest corner of Lot 10.

3. Prior to 1913, a large portion of Parcel 1 consisted of a formation known as Avery Bar.

4. That portion of the bed of the Willamette River occupied by Avery Bar was not a part of Fischer Cut, discussed under Parcels 2A, 2B and 2C.

5. Prior to 1913, Avery Bar originated as an island on the bed of the river below the lines of ordinary low water.

6. Subsequently and by accretion, prior to 1913, the island joined the uplands on the left bank at the ordinary low water mark in front of government lots 9 and 10.

7. Thereafter, a point bar developed on top of the joinder.

8. Thereafter, the railroad in 1913 removed most

of the bar by dredging large quantities of rock and gravel.

9. The state owned from ordinary high water mark to ordinary low water mark in front of government lots 9 and 10.

10. The point bar, known as Avery Bar, accreted to land owned by the state, that is, to the island which had originated in the bed of the river below ordinary low water.

11. Therefore, it is not material whether the accreted mass became covered with water from whatsoever cause, be it the wingdike constructed by the Corps of Engineers in 1948, discussed under Parcel 4, or the dredging of Avery Bar by the railroad in 1913-1914.

B. **Conclusion of Law**

Plaintiff owns Parcel 1.

VI.

Parcels 2A, 2B, and 2C

A. **Findings of Fact**

1. Fischer Island from 1853 to 1909 was a peninsula-like formation around which the Willamette River coursed.

2. By 1890 a clearly discernible overflow channel over the neck of the peninsula had developed known as Fischer Cut.

3. In 1890 Fischer Cut would have had to be cleared of driftwood and willow growth before it could possibly accommodate the flow of the river. The Fischer

Cut Channel was dry at low water, or below the five-foot stage, and carried water only at intermediate or high stages of the river.

4. In January of 1906 the Fischer Cut Channel was in practically the same location as it was in 1890. It was estimated then that roughly one-quarter of the flow of the river was carried through Fischer Cut.

5. Between 1890 and 1909 the high water overflow through Fischer Cut did not sufficiently clear Fischer Cut to allow for the full flow of the river and the river continued to flow around Fischer's Island during that period.

6. As the result of a flood of November 25, 1909, the river suddenly and with great force and violence converted Fischer Cut into the main channel of the river.

7. The change was not gradual and imperceptible but was a rapid and violent change of course, avulsive in character and constituted an avulsion.

8. Parcels 2A, 2B and 2C combined are included in the area known as Fischer Cut.

B. **Conclusion of Law**

Defendant owns Parcel 2A, 2B and 2C.

VII.

Parcel 3

A. **Findings of Fact**

1. Portion of Parcel 3 below confluence of East River.

(a) Parcel 3 lies in the bed of the river between ordinary low water marks.

(b) The portion of Parcel 3 downstream from a line extended from the low water mark of the left bank of East River (prior to 1909, the Willamette River) extended across the Willamette River, lies within the bed of the River over which the river has coursed in substantially the same manner since 1853.

2. Portion of Parcel 3 upstream of confluence of East River.

(a) This portion of Parcel 3 is a part of government lots 11 and 12, Section 1, which lots were patented prior to 1878.

(b) Defendant's predecessor in title under the laws of 1874, p. 76, owned to the low water mark of the Willamette River as it coursed around Fischer's Island.

(c) That part of the Willamette River changed course in 1909 to Fischer's Cut, and the former bed of the Willamette River is now named East River.

B. **Conclusion of Law**

1. Plaintiff is the owner of that portion of Parcel 3 below the confluence of East River as delineated by a line extended from the low water mark of the left bank of East River (prior to 1909, the Willamette River) across the Willamette River.

2. Defendant is the owner of that portion of Parcel 3 upstream from the line extended from the low water mark of the left bank of East River across the Willamette River.

VIII.

Parcel 4

A. **Findings of Fact**

1. Parcel 4 is an accreted formation lying on the right bank of the Willamette River just downstream from the City of Corvallis Water intake structure. The riverward boundary of this parcel is the ordinary low water line as defined by the court. The landward boundary line is the ordinary low water line as it existed around a portion of this parcel in July of 1969 and extended around the remainder.

2. A substantial part of Parcel 4 was in the bed of the river below low water marks prior to the construction of a wingdike by the Army Corps of Engineers in 1948.

3. This accreted formation originated in the river bed as either an island or a point bar, below the lines of ordinary low water.

4. This accreted formation rose from the bed and joined the upland at low water marks along the right bank.

5. The accretion was the direct result of the construction by the Corps of Engineers of a wingdike in 1948 which was placed on the island or point bar prior to its joinder to the upland.

6. Since the accretion originated from the state

owned bed below the lines of ordinary low water, it belonged to the state.

B. **Conclusion of Law**

Plaintiff owns Parcel 4.

IX.

Parcel 5

A. **Findings of Fact**

1. Parcel 5 lies in the bed of the river between the lines of ordinary high and ordinary low along the left bank of the river.

2. Inasmuch as Parcel 5 fronts government lots 9 and 10, defendant's predecessors in title acquired no right therein under laws of 1874, page 76.

B. **Conclusion of Law**

Plaintiff owns that portion of Parcel 5 which lies below the ordinary high water mark.

X.

Parcel 6

A. **Findings of Fact**

1. Parcel 6 lies in the bed of the river between the lines of ordinary high and ordinary low water along the left bank of the river.

2. Parcel 6 is not within the avulsive channel of Fischer Cut.

3. Defendant's predecessor in title acquired no right therein by virtue of Laws of 1874, p. 76.

B. **Conclusion of Law**

Parcel 6, including any portion thereof which may consist of portions of the Avery Bar, and within the lines of high and low water, is in the plaintiff.

XI.

Parcel 7

A. **Findings of Fact**

1. Parcel 7 lies in the bed of the river between the lines of ordinary high and ordinary low water along the left bank of the river.

2. Parcel 7 is not within the avulsive channel of Fischer Cut.

3. A portion of Parcel 7 occupies submersible lands in front of government lot 12 of section 12. The remaining portion of Parcel 7 was not riparian prior to the repeal of laws of 1874, page 76, by laws of 1878, pages 54-55.

4. Therefore, defendant's predecessors in title acquired no right therein by virtue of the laws of 1874, p. 76.

B. **Conclusion of Law**

Parcel 7, including any portion thereof which may consist of portions of the Avery Bar, and within the lines of high and low water, is in the plaintiff.

Parcel 8

A. **Findings of Fact**

1. Parcel 8 was a point bar, joined to the uplands above the low water mark.

2. The uplands were patented during the effective period of laws, 1874, p. 76.

B. **Conclusion of Law**

Parcel 8 belongs to the defendant.

Parcel 9

A. **Findings of Fact**

1. Defendant disclaims any interest in Parcel 9.

2. Parcel 9 presently lies within the bed of the river between the lines of ordinary high and low water marks as determined by the court.

B. **Conclusion of Law**

Plaintiff, as against the defendant, owns Parcel 9.

XII.

Damages

A. **Findings of Fact**

1. Plaintiff is entitled to recover damages for the period of six years immediately preceeding the filing of the original complaint herein until to date, namely, from June 7, 1959, to date.

2. Defendant is not entitled to an offset for "avoidable consequences" or for failure to mitigate damages.

3. Plaintiff is entitled to damages at 12.5 cents per cubic yard of minerals removed, which the Court finds would have been a reasonable sum to be paid as royalty during the entire period of wrongful withholding.

4. Plaintiff is entitled to damages upon the total

amount of minerals taken within the low-high water boundaries established by this Court.

5. With respect to materials that were removed, the Court finds as follows:

(a) 574,000 cubic yards of minerals were removed from Parcel 1.

(b) 56,000 cubic yards of minerals were removed from Parcel 3. The materials so removed were not subject to the lease between the parties and were in addition to the materials removed by the defendant from Parcel 3, which were subject to the terms of the lease between the defendant and the plaintiff.

(c) No material was removed from Parcel 4.

(d) 9,000 cubic yards of minerals were removed from Parcel 5.

(e) 21,000 cubic yards of minerals were removed from Parcel 6.

(f) No minerals were removed from Parcel 7.

(g) The total amount of minerals removed from plaintiff's property was 660,000 cubic yards.

B. **Conclusions of Law**

1. Plaintiff is entitled to recover damages in the amount of $82,500 from the defendant.

2. The damages are unliquidated and plaintiff is entitled to interest only from the date of Judgment.

Dated this 19th day of June, 1972.

/s/ RICHARD MENGLER
Circuit Judge

IN THE CIRCUIT COURT
OF THE STATE OF OREGON
FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff, vs. CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation, Defendant.	)))))))	No. 21512 Supplement to Court's Findings of Fact and Conclusions of Law

WHEREAS, on June 19, 1972, the Court entered its Findings of Fact and Conclusions of Law; and

WHEREAS, the parties filed objection thereto and requested other and different findings; and

WHEREAS, the plaintiff was to submit detailed property descriptions as part of the Court's findings by way of Supplement thereto,

NOW, THEREFORE, the Court does hereby enter its Supplement to its Findings of Fact as follows:

1. Findings of Fact IV A. 2.(a), Page 3, Line 7 is amended to read, "207.7".

2. Findings of Fact VI A. 3., Page 4, Line 27, is amended by deleting, "possibly".

3. Findings of Fact X, Page 8, is amended by adding the following additional finding after Line 10, Page 8:

"4. Parcel 6 formed in the bed of the river after 1878 and accreted to the uplands at the low water mark on the frontage of government lots 10, 11 and 12 of Section 12. The accreted formation cut off the submersible lands fronting what remained of Government Lot 11."

4. A legal description of each of the parcels involved in this litigation, as amended by the Court's Findings of Fact and Conclusions of Law and the within Supplement thereto, is annexed hereto as Exhibits A through K and made a part hereof by reference.

Dated this 28 day of July, 1972.

/s/ RICHARD MENGLER
Circuit Judge

COPY OF JUDGMENT OF
BENTON COUNTY CIRCUIT COURT
No. 21512
(Parcel Legal Descriptions omitted)

IN THE CIRCUIT COURT

OF THE STATE OF OREGON

FOR THE COUNTY OF BENTON

STATE OF OREGON, Acting by and through the State Land Board, Plaintiff, vs. CORVALLIS SAND AND GRAVEL COMPANY, an Oregon Corporation, Defendant.	)	No. 21512 JUDGMENT

The above entitled matter having come on regularly for trial before the Court without a jury; plaintiff appearing through its attorneys Lee Johnson, Attorney General; by Peter S. Herman, Senior Counsel; and Philip J. Engelgau, Assistant Attorney General; defendant appearing through its president, John H. Gallagher, and through its attorneys, Robert Mix and George Mead; and the Court having considered the evidence of the parties and the arguments of counsel and having heretofore denied defendant's motion to reconsider the Court's previous rulings on the pleadings, and the Court having entered its Findings of Fact and Conclusions of Law and its Supplement thereto;

NOW, THEREFORE, the Court does hereby order and adjudge as follows:

I.

Defendant's motion asking the Court to reconsider its previous rulings on the pleadings is denied.

II.

Parcel 1

Plaintiff is the owner in fee simple of Parcel 1, and is entitled to the immediate possession thereof; it is THEREFORE ORDERED that plaintiff have the immediate possession thereof from the defendant. A legal description of Parcel 1 is annexed hereto as Exhibit A and made a part hereof.

It is FURTHER ORDERED that plaintiff do have and recover from the defendant the sum of Seventy-One Thousand Seven Hundred Fifty Dollars ($71,750.00) as damages for the wrongful withholding of possession of Parcel 1 by the defendant from July 1, 1959, to the date of this Judgment.

III.

Parcels 2A, 2B and 2C

Defendant is the owner in fee simple and entitled to the possession of Parcels 2A, 2B and 2C. A legal description of Parcels 2A, 2B and 2C is annexed hereto as Exhibits B, C and D, respectively, and made a part hereof.

IV.

Parcel 3

Plaintiff is the owner in fee simple of Parcel 3 and was entitled to the immediate possession of said parcel prior to July 1, 1963, the beginning date of the ten year lease between the parties covering said parcel. A legal description of said parcel is annexed hereto as Exhibit E and made a part hereof.

It is THEREFORE ORDERED that Plaintiff do have and recover from the defendant the sum of Seven Thousand Dollars ($7,000.00) as damages for the wrongful withholding of possession of said parcel by the defendant on and between July 1, 1959, and July 1, 1963.

V.

Parcel 4

Plaintiff is the owner in fee simple of Parcel 4 and is entitled to the immediate possession of said parcel; it is THEREFORE ORDERED that plaintiff have the immediate possession thereof from the defendant. A legal description of Parcel 4 is annexed hereto as Exhibit F and made a part hereof.

VI.

Parcel 5

Plaintiff is the owner in fee simple of Parcel 5 and entitled to the immediate possession of Parcel 5; it is THEREFORE ORDERED that plaintiff have the immediate possession thereof from the defendant. A legal description of Parcel 5 is annexed hereto as Exhibit G and made a part hereof.

It is FURTHER ORDERED that plaintiff do have and recover from the defendant, the sum of One Thousand One Hundred Twenty-Five Dollars ($1,125.00) for the wrongful withholding of possession of said parcel by the defendant from July 1, 1959, to the date of this Judgment.

VII.

Parcel 6

Plaintiff is the owner in fee simple of Parcel 6 and is entitled to the immediate possession of Parcel 6; it is THEREFORE ORDERED that plaintiff have the immediate possession thereof from the defendant. A legal description of Parcel 6 is annexed hereto as Exhibit H and made a part hereof.

It is FURTHER ORDERED that plaintiff do have and recover from the defendant the sum of Two Thousand Six Hundred Twenty-Five Dollars ($2,625.00) for the wrongful withholding of possession of said parcel by the defendant from July 1, 1959, to the date of this Judgment.

VIII.

Parcel 7

Plaintiff is the owner in fee simple of Parcel 7 and is entitled to the immediate possession of Parcel 7; it is

THEREFORE ORDERED that plaintiff have the immediate possession thereof from the defendant. A legal description of Parcel 7 is annexed hereto as Exhibit I and made a part hereof.

IX.

Parcel 8

Defendant is the owner in fee simple and entitled to the possession of Parcel 8. A legal description of Parcel 8 is annexed hereto as Exhibit J and made a part hereof.

X.

Parcel 9

Plaintiff is the owner in fee simple of Parcel 9 and is entitled to the immediate possession of Parcel 9; it is THEREFORE ORDERED that plaintiff have the immediate possession thereof from the defendant. Defendant disclaims any interest in said parcel. A legal description of said parcel is annexed hereto as Exhibit K and made a part hereof.

Based on the above items of damages awarded plaintiff, it is ORDERED AND ADJUDGED that plaintiff do have and recover from the defendant the grand total of Eighty-Two Thousand Five Hundred Dollars ($82,500.00) and its costs and disbursements herein incurred which are taxed in the sum of $371.50.

Dated this 28th day of July, 1972.

/s/ RICHARD MENGLER
Circuit Judge

OPINION OF THE OREGON COURT OF APPEALS

No. 1940—September 9, 1974

STATE EX REL STATE LAND BOARD, *Appellant–Cross-Respondent, v.* CORVALLIS SAND AND GRAVEL COMPANY (No. 21512), *Respondent–Cross-Appellant.*

Appeal from Circuit Court, Benton County.

RICHARD MENGLER, Judge.

Argued and submitted July 15, 1974.

Peter S. Herman, Senior Counsel, Salem, argued the cause for appellant–cross-respondent. With him on the briefs were Lee Johnson, Attorney General, and W. Michael Gillette, Solicitor General, Salem.

Robert Mix, Corvallis, argued the cause and filed the briefs for respondent–cross-appellant.

Before SCHWAB, Chief Judge, and LANGTRY and FORT, Judges.

AFFIRMED IN PART; REVERSED IN PART.

SCHWAB, C. J.

This is an action at law in ejectment by the state pursuant to ORS 105.005, et seq., to recover possession of 11 described parcels of real property constituting portions of the bed of the Willamette River near Corvallis, and to recover damages for the reasonable value of the use of such parcels.

In 1958 the state filed a suit to quiet title to the land adjoining certain lots, which lots constitute a portion of the property in dispute now. In 1959, at trial, the case was dismissed without prejudice on

motion for a voluntary nonsuit for failure of proof. In 1960 the state filed a suit for an accounting and an injunction covering the area in dispute in the case at bar. This case was voluntarily dismissed in 1961 by the state before it was at issue.

The first complaint in this action was filed by the state on June 7, 1965. In the complaint the portion of the riverbed in dispute was described as one parcel; the portions of the riverbed now constituting Parcels 2A, 2B and 2C were omitted. Instead of answering, the defendant filed a complaint in equity seeking to permanently enjoin the state's ejectment action. The state demurred to the complaint. The trial court overruled the demurrer and a decree was entered in favor of Corvallis Sand and Gravel. On appeal the Supreme Court reversed. *Corvallis Sand & Gravel v. Land Board,* 250 Or 319, 439 P2d 575 (1968).

On December 23, 1969, the plaintiff filed its first amended complaint in ejectment in which it described the riverbed it sought to recover as 11 separate parcels and claimed damages for the use of each parcel. On July 7, 1970, the defendant filed its answer, denying the allegations of the complaint and raising 12 affirmative defenses. After procedural disputes leading to several amended answers, trial was held before the court without a jury, commencing October 11, 1971.

On May 25, 1972, the trial court issued a memorandum opinion awarding various parcels to each party and setting the amount of damages for the previous use by defendant of those parcels awarded to the state. Findings of fact and conclusions of law were entered on June 19, 1972. The court supplemented

these findings on July 28, 1972, and judgment was entered the same day. The state appeals from that portion of the order which awards parcels described for the purposes of this litigation as 2A, 2B and 2C to the defendant, on the ground that it erred in finding that these parcels were formed by avulsion, and from the failure of the trial court to award interest on the money judgment from the date of taking by defendant to the date of the judgment. The defendant cross-appeals from a variety of procedural rulings of the court, and the striking of certain of its affirmative defenses, the award of certain parcels to the state, and the award of damages. For the reasons which follow, we affirm the trial court in all its rulings and its judgment with the exception of one relatively minor item of damages which we reverse.

I. Scope of Review

The scope of appellate review of the facts presented in this case was stated in *Reif v. Botz,* 241 Or 489, 496, 406 P2d 907 (1965):

> "* * * On appeal in an action at law from findings of fact by a trial court sitting without a jury, this court cannot again place the evidence on the scales to see which side preponderates. We must confine ourselves to a search of the record for some evidence to support the findings. If we so find * * * those findings cannot be disturbed."

See also, May v. Chicago Insurance Co., 260 Or 285, 490 P2d 150 (1971); *State Highway Com. v. DeLong Corp.,* 9 Or App 550, 495 P2d 1215, Sup Ct *review denied* (1972), *cert denied* 411 US 965 (1973). The various findings of fact as to the formation of the various parcels and the amount of material removed

from each parcel must be reviewed in light of this standard.

Much of the dispute in this case centers around the difference in testimony of the expert witnesses of the parties. The credibility of the various witnesses and the weight to be given to their testimony is a matter for the trial court and will not be passed upon again by this court in a law action. *Armbrust v. Travelers Ins. Co.*, 232 Or 617, 376 P2d 669 (1962).

Finally, we should note that when we state facts in this case, we are using the findings of fact of the trial court in all instances in which there is a conflict in the evidence.

II. Ownership of the Parcels in Dispute

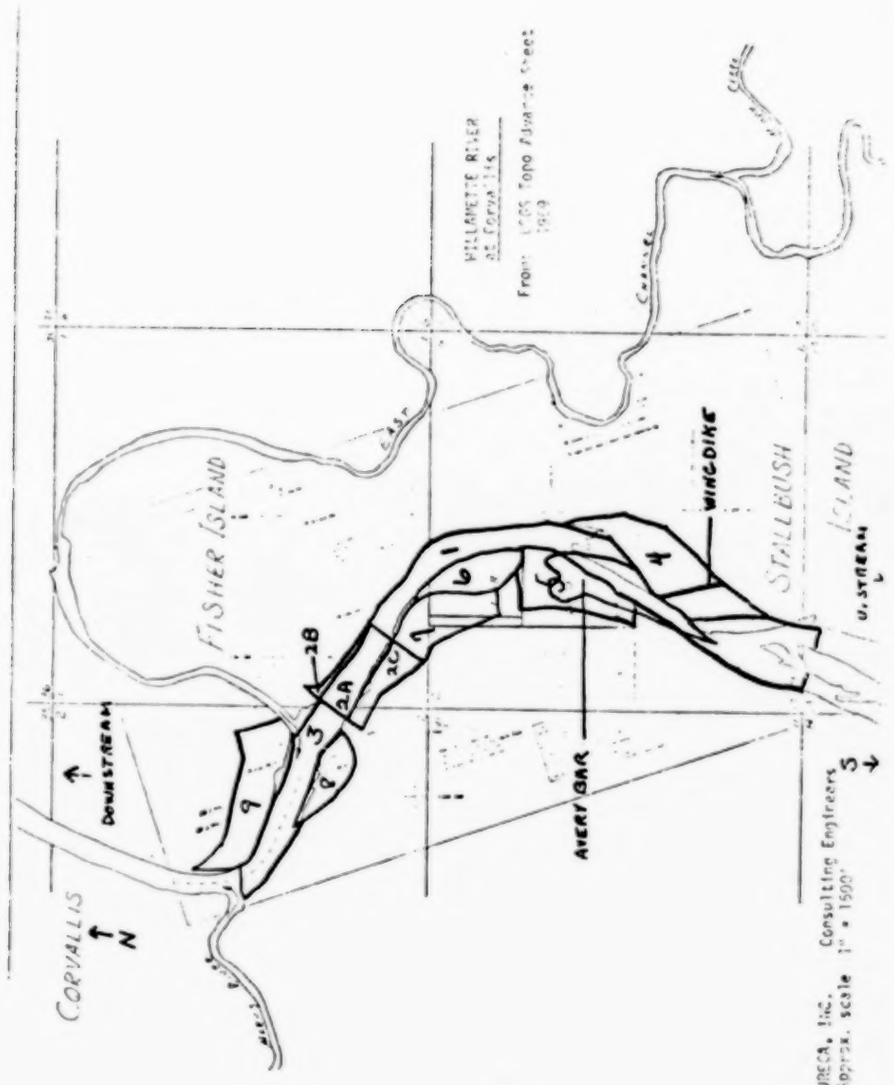
This litigation involves ownership questions of certain parcels of the bed of the Willamette River[1] near Corvallis, Oregon, which parcels lie between ordinary high watermarks in an area bounded by the Mary's River on the north or downstream end, and the City of Corvallis Water Treatment Plant to the south or upstream end. For the purposes of this litigation, the state, in its complaint, divided this section of the river into 11 separate parcels.[2] On appeal, the ownershp of eight of these parcels is in issue.

In order to put the ownership question into perspective, a brief overview of the facts is necessary. Prior to the latter part of 1909, the northerly portion

[1] Neither party contests the fact that the Willamette River is navigable in the area involved in this litigation. For a comprehensive view of the geography of the disputed area, *see* map at 1536.

[2] For a discussion of the propriety of splitting the disputed area into separate parcels and causes of action, *see* pp 1564-1566, infra.

of the Willamette River now shown on the attached map as the East Channel was the main channel of the river. Prior to 1909 the main channel veered to the east from a point just south of what is shown as Parcels 2A, 2B and 2C, went around the east side of Fischer Island and rejoined what is now the main



channel at a point to the northwest of Parcels 2A, 2B and 2C. The area shown on the map as Parcels 2A, 2B and 2C, and described as the Fischer Cut area was a minor non-navigable channel which was submerged only seasonally. However, following a storm and flood in late 1909, the area known as Fischer Cut became the main channel of the river and the East Channel gradually became non-navigable.

With regard to Parcels 2A, 2B and 2C, the issue involves the consequences of this change of channels, with the state claiming ownership by virtue of its sovereignty over navigable waters and the application of an erosion principle. The defendant contends that the change was actually avulsive and that, in any event, the state's sovereignty does not extend to the bed of the river included within these parcels.

With regard to other of the parcels the issue is who was holder of the original title. Finally, with some parcels, the issue arises because of formations of islands within the bed of the river, accretions thereto, removal of gravel deposits by the railroad, the construction of a wingdike in 1948 by the Army Corps of Engineers, and the general erosive and accretive processes of the river over the course of time.

The trial court awarded Parcels 2A, 2B and 2C to the defendant, and all the others to the state. Both parties raise a variety of factual and legal contentions in opposition to the findings and conclusions of the trial court. We will treat each parcel separately recognizing that, to some degree, the factual discussion as to each parcel will overlap somewhat the general discussion above.

A. Parcels 2A, 2B and 2C (Fischer Cut)

As indicated on the map, Parcel 2A is comprised of bottom land of the Willamette River between ordinary low water. Parcel 2B is riverbed between ordinary high and ordinary low water on the right bank of the river. Parcel 2C is riverbed between the ordinary high water and ordinary low water on the left bank of the river. The trial court made the following findings of fact concerning the area within the Fischer Cut:

> "1. Fischer Island from 1853 to 1909 was a peninsula-like formation around which the Willamette River coursed.
>
> "2. By 1890 a clearly discernible overflow channel over the neck of the peninsula had developed known as Fischer Cut.
>
> "3. In 1890 Fischer Cut would have had to be cleared of driftwood and willow growth before it could possibly accommodate the flow of the river. The Fischer Cut Channel was dry at low water, or below the five-foot stage, and carried water only at intermediate or high stages of the river.
>
> "4. In January of 1906 the Fischer Cut Channel was in practically the same location as it was in 1890. It was estimated then that roughly one-quarter of the flow of the river was carried through Fischer Cut.
>
> "5. Between 1890 and 1909 the high water overflow through Fischer Cut did not sufficiently clear Fischer Cut to allow for the full flow of the river and the river continued to flow around Fischer's Island during that period.
>
> "6. As the result of a flood of November 25, 1909, the river suddenly and with great force and violence converted Fischer Cut into the main channel of the river.

"7. The change was not gradual and imperceptible but was a rapid and violent change of course, avulsive in character and constituted an avulsion.

"8. Parcels 2A, 2B and 2C combined are included in the area known as Fischer Cut."

The state argues that ownership of the entire Fischer Cut area passed to the state by virtue of its sovereignty over navigable waters regardless of the manner of the formation of the cut. It also argues that regardless of the state's sovereignty, title to the Fischer Cut river bottom passed to the state because the Fischer Cut did not result from an avulsive change since an existing channel of the river was present prior to its enlargement. Defendant argues that the change was avulsive and that, in any event, *Bonelli Cattle Co. v. Arizona,* 414 US 313, 94 S Ct 517, 38 L Ed 2d 526 (1973), controls the ownership question.

1. The Sovereignty Issue

Under the equal-footing doctrine, as new states were admitted to the Union, they entered with the same rights, sovereignty and jurisdiction as the original states possessed within their respective borders. Accordingly, under the equal-footing doctrine, title to the lands beneath navigable waters passed from the federal government to the state of Oregon upon its admission to the Union. *Bonelli,* 38 L Ed 2d at 534; An Act for the Admission of Oregon into the Union, ch 33, 11 Stat 383. Further, under the Submerged Lands Act, 43 USC § 1301 (a) (1), the federal government quitclaimed all federal title to lands beneath navigable streams, as modified by accretion, erosion or reliction. By virtue of its sovereignty over navigable

waters, the state contends that its title to the bed of the Willamette River follows the course of the river wherever it may move. Otherwise, the state argues, the bed will become a "checkerboard" of public and private ownership, seriously impairing the public use of the waters.

Questions of title to beds of navigable rivers must be evaluated in light of *Bonelli Cattle Co. v. Arizona,* supra. In *Bonelli,* the Supreme Court recognized the principle that it would be left to the states to determine what rights they would accord riparian owners in the beds of navigable streams which under federal law belong to the state. However, the question of how far the state's sovereign right extends under the equal-footing doctrine and under the Submerged Lands Act was found to involve a question of right asserted under federal law and, thus, federal common law would apply.

While *Bonelli* involved title to lands formerly under the main channel that had since become dry, the basic public policy discussion is equally applicable to the case where certain lands which were not under water are presently under water. The court in *Bonelli* first noted that, historically, title to the beds beneath navigable waters is held by the sovereign as a public trust for protection of navigation and related purposes. The court continued:

"'Such waters * * * are incapable of ordinary and private occupation, cultivation and improvement; and their natural and primary uses are public in their nature, for highways of navigation and commerce, domestic and foreign, and for the purpose of fishing * * *.' Shively v. Bowlby * * *

[152 US 1, 11, 38 L Ed 331, 14 S Ct 548 (1894)]."

"The State's title is to the 'riverbed as a bed' • • •." *Bonelli Cattle Co. v. Arizona,* supra, 38 L Ed 2d at 536.

The fundamental purpose of the original grant involves navigational and related interests and the state can often protect these interests by holding a navigational servitude rather than by holding title to the bed.[9]

While the extent of the state's interest should not be narrowly construed because it is denominated a navigational purpose, *see, Bonelli Cattle Co. v. Arizona,* supra, n 15, the implication is clear that the other purposes must somehow be related to the navigational purpose. The only public purpose cited by the state deals with the question of public recreation in terms of wading, fishing, boating or swimming. However, such rights can be controlled under the navigational purpose doctrine, and title to the bed, asserted here only for the extraction of royalty payments, is not necessary. Certainty of title and other arguments raised by the state under its sovereignty argument do not relate to this legitimate state interest in control of navigation and fishing.

The first portion of *Bonelli* thus stands for several basic propositions. First, the extent of title to submerged lands and navigable waterways must be determined by federal common law. Second, the state's

[9] The court directs the reader to Note, *Artificial Additions to Riparian Land: Extending the Doctrine of Accretion,* 14 Ariz L Rev 315 (1972), wherein the author speaks in terms of title being burdened with the state's "navigational easement." *See,* Bonelli Cattle Co. v. Arizona, 414 US 313, 94 S Ct 517, 38 L Ed 2d 526, 536, n 12 (1973).

interest in the bed of navigable waters is basically that of the control of navigation, fishing and other related public goals. So the sovereignty principle alone will not support title of the state in these parcels. Thus we must turn to *Bonelli* and other federal cases to determine whether title to the bed passed to the state under the facts presented in the case at bar.

2. Nature of the Change in the River's Course

The court in *Bonelli* first noted that federal law recognizes the doctrine of accretion whereby the grantee of land bounded by a body of navigable water acquires a right to any gradual accretion formed along the shore. The court then discussed a number of interrelated policy reasons for the application of doctrine of accretion, which reasons refer to the risk a riparian owner runs that his land could be eroded by the action of the adjoining waterway. Under the court's analysis loss of land on a navigable waterway by a riparian owner to erosion would result in title to the bed passing to the state. *See, Bonelli Cattle Co. v. Arizona,* supra, 38 L Ed 2d 534, 536-37.

As defined in *Bonelli,* 38 L Ed 2d at 538, and other federal cases,[9] the doctrine of accretion requires the gradual, imperceptible accumulation of land on a navigable river bank. As found by the trial court and admitted by the state, there was no gradual addition or accumulation of land in this case. Rather, the river started to flow through a new channel. Since the accretion doctrine does not apply, the question is what this change to a new channel is denominated under

[9] *See,* Philadelphia Co. v. Stimson, 223 US 605, 32 S Ct 340, 56 L Ed 570 (1912).

federal common law and how such a change affects title to the riverbed.

One possibility is that this change was avulsive, as found by the trial court. As defined in *Bonelli,* 38 L Ed 2d at 539, an avulsion occurs where a stream suddenly and perceptibly abandons its old channel. Other federal cases state that such change must be visible in its progress. *See, St. Louis v. Rutz,* 138 US 226, 11 S Ct 337, 34 L Ed 941 (1891). Such an avulsive change does not affect title to the lands submerged by the water since this is not one of the risks run by a nonriparian landowner. *Bonelli Cattle Co. v. Arizona,* supra; *Philadelphia Co. v. Stimson,* 223 US 605, 32 S Ct 340, 56 L Ed 570 (1912); *St. Louis v. Rutz,* supra. While title does not change, the submerged lands do become subject to the public right of navigation, fishing and other related public purposes. *See* discussion, supra, at 10-11. The trial court found that the change in the Fischer Cut area was sudden and perceptible and, thus, constituted an avulsion. We find evidence in the record to support this conclusion.[5]

But even if the doctrine of avulsion does not adequately fit the facts in the case at bar, there is a middle course between the avulsion and accretion doc-

[5] The state relies heavily upon Purvine v. Hathaway, 238 Or 60, 393 P2d 181 (1964), to support its position that this change was not avulsive in nature. First, it should be noted that federal common law controls ownership questions under *Bonelli* and, thus, state cases are of limited applicability. Second, *Purvine* did not involve the question of the state's ownership of the riverbed but rather involved boundary questions. Finally, the court found that an avulsive change had not been proved on the facts and that, for policy reasons, the court did not wish to apply the avulsion theory because of the effect that theory could have on boundary questions in the future.

trines which perhaps more accurately reflects the facts presented. This is the so-called exception to the accretion rule announced in *Commissioners v. United States,* 270 F 110, 113-14 (8th Cir 1920):

> "* * * [The accretion rule] is applicable to and governs cases where the boundary line, the thread of the stream, by the slow and gradual processes of erosion and accretion creeps across the intervening space between its old and its new location. To this rule, however, there is a well-established and rational exception. It is that, where a river changes its main channel, not by excavating, passing over, and then filling the intervening place between its old and its new main channel, but by flowing around this intervening land, which never becomes in the meantime its main channel, and the change from the old to the new main channel is wrought during many years by the gradual or occasional increase from year to year of the proportion of the waters of the river passing over the course which eventually becomes the new main channel, and the decrease from year to year of the proportion of its waters passing through the old main channel until the greater part of its waters flow through the new main channel, the boundary line between the estates remains in the old channel subject to such changes in that channel as are wrought by erosion or accretion while the water in it remains a running stream * * *."

While the court treated this as a form of accretion, the result is the same as avulsion in that the boundary line was found not moved to the new main channel but rather remained in the old main channel. In fact, at least one court claims that the rule in *Commissioners* was a rule of avulsion. *See, Durfee v. Keiffer,* 168 Neb 272, 95 NW2d 618 (1959). The rule of *Commissioners*

was apparently recognized in *Kansas v. Missouri*, 322 US 213, 64 S Ct 975, 88 L Ed 1234 (1944).

Since the rule of *Commissioners* yields the same outcome as the avulsive theory, the same result would apply as to the title of the newly submerged lands, namely, that it remains in the former owner and does not pass to the state. The government will hold the paramount navigational servitude, but will not become the owner of the submerged lands.

3. Conclusions

There are several conclusions we distill from *Bonelli* and other cases dealing with navigable waterways. First and most important is that the state's right in the bed of the river is a limited right and relates to a navigational or related purpose. Lands granted to the state of Oregon upon its admission in 1859 which were under water and are still under water belong to the state of Oregon at this time. While the grant of the bed in 1859 is not absolutely necessary for the paramount public purpose of control of navigation, it was, perhaps, the way the Congress felt the question of title to riverbeds should be determined. It can also be determined from *Bonelli* that where a bed of a river shifts by a slow process of erosion or accretion, title of the state to the bed of the river follows the change. However, where there is an avulsive change or a change that, under *Commissioners*, is treated like an avulsive change, the state does not obtain title to land under the water as it presently flows. The state's interest in navigation and other related purposes does not extend to a need for ownership of the riverbed.

Adequate evidence was introduced to support either the theory of avulsion as found by the trial court or a situation similar to that in *Commissioners*. But under either theory, the outcome is the same—the ownership of the land under the river does not change. The ownership of the overflowed lands in Parcels 2A, 2B and 2C remains with the owner of those lands before the changes of 1909, subject only to the paramount navigational servitude held by the state. This portion of the judgment of the trial court is affirmed.

B. Parcel No. 1

Parcel No. 1 lies between the present lines of ordinary low water with its upstream limits delineated by a line at right angles to the river and opposite the City of Corvallis Water Treatment Plant, and its downstream limits coinciding with the upstream limits of Parcel 2A. The trial court ruled that Parcel 1 belonged to the state. There are three separate issues involves in the ownership question of Parcel No. 1: (1) the length of the Fischer Cut; (2) the ownership of an area denominated the Avery Bar; and (3) the effect of the U.S. Army Corps of Engineers' wingdike. These will be treated separately.

1. Length of the Fischer Cut

The defendant contends that the change of 1909, which it terms an avulsion, extended a distance of 3200 feet upstream from the downstream ends of Parcels 2A, 2B and 2C, and, therefore, included a portion of Parcel 1. The trial court ruled that the Fischer Cut did not extend upstream above Parcels 2A, 2B and 2C. However, the court did find that a small portion of Parcel 3 was included within the limits of Parcels 2A,

2B and 2C. This makes the cut area approximately 1600 feet in length. There is ample evidence both in the maps and in testimony of the state's expert witness to support this finding. The cut did not extend into Parcel 1.

2. The Avery Bar Issue

The Avery Bar area extends from Parcel 5 through Parcel 1. The defendant contends that when the Avery Bar was removed for gravel purposes by the railroad in the early twentieth century, the river moved back in over the excavated land. It argues that Avery Bar arose as an accretion from Parcels 5 and 6 which the defendant also contends it owns and, as such, when it was covered by water, it still belonged to the defendant. The trial court made the following finding of fact:

"• • • • •

"3. Prior to 1913, a large portion of Parcel 1 consisted of a formation known as Avery Bar.

"4. That portion of the bed of the Willamette River occupied by Avery Bar was not a part of Fischer Cut, discussed under Parcels 2A, 2B and 2C.

"5. Prior to 1913, Avery Bar originated as an island on the bed of the river below the lines of ordinary low water.

"6. Subsequently and by accretion, prior to 1913, the island joined the uplands on the left bank at the ordinary low water mark in front of government lots 9 and 10 [Parcel 5].

"7. Thereafter, a point bar developed on top of the joinder.

"8. Thereafter, the railroad in 1913 removed most of the bar by dredging large quantities of rock and gravel.

"9. The state owned from ordinary high water mark to ordinary low water mark in front of government lots 9 and 10 [ownership of these lots discussed infra at 1551-1553].

"10. The point bar, known as Avery Bar, accreted to land owned by the state, that is, to the island which had originated in the bed of the river below ordinary low water.

"11. Therefore, it is not material whether the accreted mass became covered with water from whatsoever cause, be it the wingdike constructed by the Corps of Engineers in 1948, discussed under Parcel 4, or the dredging of Avery Bar by the railroad in 1913-1914."

It is established that if an island or dry land forms upon that part of the bed of a river which is owned in fee by the riparian proprietor, the same is a property of said riparian proprietor. *St. Louis v. Rutz,* supra, 138 US at 245. Further, the owner of an island is entitled to land added thereto by accretion. 65 CJS 261, Navigable Waters § 82 (6).

Once again the facts settle into separate positions taken by the parties' expert witnesses. The state's witness claimed that the Avery Bar started as an island and that the deposits accreted to the island. The defendant's witness, on the other hand, contended that Avery Bar was an accretion to the uplands, namely Parcels 5 and 6, which the defendant claims it owns. There is evidence to support the trial court's finding and it is affirmed.

3. 1948 Corps of Engineers' Wingdike Formation

Much of this argument overlaps the Avery Bar argument, supra. The defendant contends that a wing-

dike constructed by the Corps of Engineers in 1948 further covered part of Parcel 1 made up of the Avery Bar area. It again argues that Avery Bar was an accretion to the uplands which the defendant owned and that the avulsive change caused by the wingdike allowed ownership of the land of Avery Bar to continue in defendant. The trial court's finding of fact in the matter is set out in full, supra. There is evidence to support these findings.

C. Parcel 3

Parcel 3 lies in the bed of the river between ordinary low watermarks and runs from the upstream end of Parcel 2A past the confluence with the East River to a point approximately equal to the confluence with Mary's River. On July 1, 1963, the state leased to the defendant for a term of ten years that portion of Parcel 3 beginning at the confluence with the East River and extending downstream for approximately 4,000 feet. The trial court split Parcel 3, awarding the downstream portion from the confluence with the East River to the state, and the upstream portion from the confluence of the East River to the defendant, finding that it was within the Fischer Cut. The state appeals from that portion of the decree awarding the area upstream of the East River to defendant. There is evidence supporting a finding that the portion upstream from the confluence of the East River was included within the Fischer Cut. Under *Bonelli* and related cases, title to that land remained in the original owner.

D. Parcel 4

On appeal, defendant has abandoned all claim to this parcel so it need not be discussed herein.

E. Parcel 5

Parcel 5 lies in the bed of the river between the lines of ordinary high and ordinary low along the left bank of the river. The trial court awarded this parcel to the state below the ordinary high watermark. The defendant argues:

1. That the northerly one-third of Parcel 5 is included in the avulsive change of Fischer Cut;

2. That a portion of Parcel 5 is included in the Avery Bar area; and

3. That the Corps wingdike of 1948 was an artificial change of channel which worked no change of title, and was an artificial avulsion.

The trial court made the following findings of fact:

> "1. Parcel 5 lies in the bed of the river between the lines of ordinary high and ordinary low along the left bank of the river.
>
> "2. Inasmuch as Parcel 5 fronts government lots 9 and 10, defendant's predecessors in title acquired no right therein under laws of 1874, page 76."

The question of the length of the Fischer Cut and the formation of the Avery Bar has already been discussed above. There is evidence to support the trial court's ruling that Parcel 5 was not within the avulsive change and that the Avery Bar did not form as an accretion to Parcel 5.

There are still several portions of Parcel 5, however, that do not fall in either the Fischer Cut or Avery Bar category. The question to be resolved as to these areas involves a United States patent to certain lands and Acts of the Oregon legislature in 1874 and 1878.

In 1874, the legislature granted the area on the Willamette River between low and high water to adjacent riparian owners. General Laws of Oregon 1874, p 76.

In 1875, defendant's predecessor in interest, one Norring, filed for a homestead on Government Lots 9, 10 and 12; Parcel 5 is the area between high and low water fronting Lots 9 and 10. On October 18, 1878, the Governor signed a law repealing the statutory grant of land between high and low water on the Willamette River. General Laws of Oregon 1878, § 34, p 54. The patent to Government Lots 9 and 10 was not issued to Norring by the United States government until April of 1882. The question thus presented is whether Norring was an "owner" within the contemplation of the Oregon statute when he settled on the property in 1875 and, if not, did the patent obtained in 1882 relate back to his original entry in 1875 rendering him an owner within the contemplation of the statute.

In support of his contention that Norring was an "owner," defendant relies upon *Faull v. Cooke,* 19 Or 455, 26 P 662, 20 Am St R 836 (1890), in which the court determined what rights a homesteader acquired in land by virtue of his homestead settlement and subsequent compliance with the Act of Congress granting homesteads to actual settlers upon the public lands of the United States and the issuance to him of a patent therefor by the United States. In *Faull* the court found that a homestead patent related back to the date of settlement. However, the question here concerns not homestead rights but the granting of the state lands between high and low water to the owner of riparian lands bordering thereon. *State v. McVey,* 168 Or 337,

121 P2d 461, 123 P2d 181 (1942), speaks more nearly to the point. In *McVey* the court considered the question of ownership of a gravel bar between high and low water. The court first noted that General Laws of Oregon 1874, p 76, did not vest title in the bed between high and low water in the federal government. The court then construed the statute and tried to determine the intent of the legislature and the historical background of the legislation. The court first noted in *McVey,* 168 Or at 353-54:

> "* * * It was undoubtedly due to the fact that many riparian owners along the Willamette, Coos, Coquille and Umpqua rivers had treated the river beds between high and low water marks as private property and had sometimes improved such parts of the river beds by the erection of expensive structures, that the legislature amended the 1872 enactment so as to protect them and their investments by making a grant of the beds of those rivers above low water mark to the riparian owners * * *.
>
> "The legislature was concerned with private ownership of property abutting upon tide lands and property adjacent to the beds of certain designated navigable rivers. It was not concerned with the United States as owner of any such lands. * * * It may be noted * * * that the act did not grant to a settler the right to purchase the tide land until *after* he had received a patent from the federal government." (Emphasis supplied.)

Norring did not become an "owner" until after he had received the patent from the federal government. Since he did not receive the patent until after the date of the repeal of the Act authorizing him to obtain ownership of the land between high and low water-marks, he was not an "owner" within the terms of the statute.

The defendant's second argument is that the patent received by Norring in 1882 related back to his entry on March 15, 1875, when the statute granting ownership to the low water level was in effect. Defendant again cites numerous cases involving homestead law in which the patent does relate back to the date of entry insofar as it cuts off a title of one who enters after the original entryman. As made clear in *State v. McVey,* supra, the disposition of these lands is controlled by state law, and the doctrine of relation back will not apply.

Defendant makes reference to ORS 105.070 in support of his relation back claim. That statute declares that in an action at law for the recovery of the possession of real property, if either party claims the property as a donee of the United States under the Donation Law, such party from the date of his settlement on the property is deemed to have a legal estate and fee in the property. This statute originated in 1862 in General Laws of Oregon, § 329, p 230 (Deady 1845-1864), well before the statutes in question here and the decision in *State v. McVey,* supra. Also, this refers to lands owned by the United States government and passed under the homestead acts. It does not control the later state legislative enactments dealing with the state's land between high and low water.

F. Parcel 6

Parcel 6 also lies in the left bank of the river and consists of land between ordinary high and ordinary low water. Defendant contends that Parcel 6 is in actuality Government Lot 11 of Section 12 which was patented by the defendant's predecessor in title

before the repeal of the 1874 statute. The state admits that the patent on Government Lot 11 was completed prior to the repeal of the laws of 1874, but contends that Government Lot 11 has eroded away completely and that Parcel 6 arose from an island in the river that joined by accretion to the uplands.

The trial court made the following findings of fact:

"1. Parcel 6 lies in the bed of the river between the lines of ordinary high and ordinary low water along the left bank of the river.

"2. Parcel 6 is not within the avulsive channel of Fischer Cut.

"3. Defendant's predecessor in title acquired no right therein by virtue of Laws of 1874, p. 76.

"'4. Parcel 6 formed in the bed of the river after 1878 and accreted to the uplands at the low water mark on the frontage of government lots 10, 11 and 12 of Section 12. The accreted formation cut off the submersible lands fronting what remained of Government Lot 11.'"

Both parties agree that defendant's predecessor in title acquired rights in Government Lot 11 and the submersible lands fronting it, so paragraph 3 of the findings of fact is incorrect. However, there was adequate evidence introduced to support the finding that Government Lot 11 eroded away and that Parcel 6 formed in the bed of the river and accreted to the uplands. So long as this parcel remains submersible, title will remain in the state. *See, Bonelli Cattle Co. v. Arizona,* supra.[9]

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[9] The court in *Bonelli* adopted the doctrine of re-emergence:

"Under the doctrine of re-emergence, when identifiable riparian land, once lost by erosion, subsequently re-emerges

(Continued on page 57)

G. Parcel 7

Parcel 7 is in an area between ordinary high and ordinary low water on the left side of the river. It consists of part of Government Lot 13, Section 12, and the Alexander Donation Land Claim. The defendant contends on appeal only that Parcel 7 was within the alleged avulsive change of 1909 occurring in the Fischer Cut area and, therefore, should belong to the defendant. The trial court found that it was not within the cut. There is evidence to support this finding.

III. Procedural Questions Relating to Damages

The defendant raises several assignments of error relating to the damages awarded by the court for those parcels given to the state. The defendant first contends that the state's failure to use an *ad damnum* clause in its pleading required the trial court to exclude all evidence on damages. This contention was decided adversely to defendant's position by *Hollopeter v. Palm*, 134 Or 546, 550, 291 P 380, 294 P 1056 (1930),

(Continued from page 56)

as a result of perceptible change in the river course, title to the surfaced land revests in its former owner * * *. The re-emergence doctrine has been accepted by a number of States * * *. Because of the limited interest of the State in the former riverbed, we have held the doctrine of avulsion inapplicable to this suit between the State and a private riparian owner, who is seeking title to surfaced land *identifiable as part of his original parcel*. In that sense, we have embraced the re-emergence concept." (Emphasis supplied.) 38 L Ed 2d at 541, n 28.

In the case at bar, no evidence was introduced to show that any portion of Government Lot 11 was above ordinary high water. To the extent that a portion of Lot 11 is now emerged or re-emerges in the future, title to that portion could return to the defendant. For possible limitations on this return of title, *see*, Annotation, 41 ALR 395 (1926). On the facts as presented, we need not settle that question now.

appeal dismissed 284 US 572 (1931), wherein the court concluded that the entire omission of the *ad damnum* clause was immaterial where, as here, after a cause of action is set out there is a prayer for a specified amount.

Defendant also argues that the court erred in denying its motion to exclude evidence from the case on damages which occurred after the filing of the complaint in the original case in June of 1965. Damages in ejectment proceedings are provided for by ORS 105.030, which statute specifically permits the recovery of damages from the date of the commencement of the action to the giving of a verdict.

The defendant next contends that the court erred in denying its motion to exclude evidence relating to quantities of gravel dredged from the river. Defendant claims that since the state has pleaded as the measure of damages the reasonable value of the use of the premises for each year or, as admitted by defendant, rental value, it cannot introduce proof as to amount of gravel removed since that does not relate to rent. However, it is noted in Newell on Ejectment, ch XIX, § 3, 606-07 (1892):

> "*Whatever* would be rent, as between landlord and tenant, is mesne profits as between the parties in ejectment. But these profits frequently include matters which would hardly be termed rent as between landlord and tenant * * *." (Emphasis supplied.)

Accord, Crane v. Oregon R. & N. Co., 66 Or 317, 328, 133 P 810 (1913). Mesne profits are defined as the rents and profits or the value of the use and occupation of the real property recovered in an action of eject-

ment for the period during which the property has been wrongfully withheld. Newell, supra, § 2.

There are numerous cases which find that royalty payments pursuant to a lease would constitute mesne profits or rent in an ejectment action. *See, United States Steel Corporation v. United States,* 270 F Supp 253, 259 (SD NY 1967), *aff'd* 445 F2d 520 (2d Cir 1971), *cert denied* 405 US 917 (1972); *Moragne v. Doe, ex dem. Moragne et al.,* 143 Ala 459, 39 So 161, 111 Am St R 52 (1904); *Barnard v. Jamison,* 78 Cal App2d 136, 177 P2d 341 (1947).

Finally, under ORS 274.530, when the state leases its submersible and submerged lands in navigable streams, the lease is not payable in a lump sum but only on the basis of a price per cubic yard or ton for the material removed. Under the statute, "rent" would be the same as "royalties" and these would be determined on the basis of the total amount of material removed from the river.

In sum, where, as conceded by defendant, the state pleaded lost rent as its damages in an ejectment action, it would be able to show the value of that lost rent through the use of royalties based upon the total amount of material removed from the river.

IV. Amount of Damages

Defendant contends that the court erred in allowing any damages to the state because such damages were speculative and also that the court erred in awarding any damages to the state for the removal of sand and gravel from Parcel 3 as there was no substantial evidence to support the same. The trial court

made the following determinations in regard to damages:

"1. Plaintiff is entitled to recover damages for the period of six years immediately preceeding [sic] the filing of the original complaint herein until date, namely, from June 7, 1959, to date.

"2. Defendant is not entitled to an offset for 'avoidable consequences' or for failure to mitigate damages.

"3. Plaintiff is entitled to damages at 12.5 cents per cubic yard of materials removed, which the Court finds would have been a reasonable sum to be paid as royalty during the entire period of wrongful withholding.

"4. Plaintiff is entitled to damages upon the total amount of minerals taken within the low-high water boundaries as established by this Court.

"5. With respect to materials that were removed, the Court finds as follows:

"(a) 574,000 cubic yards of minerals were removed from Parcel 1.

"(b) 56,000 cubic yards of minerals were reremoved from Parcel 3. The materials so removed were not subject to the lease between the parties and were in addition to the materials removed by the defendant from Parcel 3, which were subject to the terms of the lease between the defendant and the plaintiff.

"(c) No material was removed from Parcel 4.

"(d) 9,000 cubic yards of minerals were removed from Parcel 5.

"(e) 21,000 cubic yards of minerals were removed from Parcel 6.

"(f) No minerals were removed from Parcel 7.

"(g) The total amount of minerals removed from plaintiff's property was 660,000 cubic yards.

"B. Conclusions of Law

"1. Plaintiff is entitled to recover damages in the amount of $82,500 from the defendant.

"2. The damages are unliquidated and plaintiff is entitled to interest only from the date of Judgment."

The state's witness testified that the royalties for the material removed ranged from 10 cents per cubic yard to 15 cents per cubic yard in the period of time during which the material was removed. There is thus evidence to support the cubic yard royalty figure established by the court. To establish the amount of damages, the state first introduced evidence dealing with the amount of gravel removed by three independent contractors. Records of the amounts dredged by the Joe Bernert Towing Company were furnished by the defendant to the state's fiscal auditor at the Division of State Lands. These records indicated the number of cubic yards removed during each year of the period 1963-1968 (with the exception of 1966 wherein no material was removed by this independent contractor). Evidence was also introduced dealing with the amount removed by the Willamette Tug and Barge Company based on the number of buckets removed during a given period in 1960 and the average number of cubic yards removed per bucket. Finally, Mr. Alfred Millar testified that he had dredged approximately 40,000 cubic yards from the river. Proof as to location of material taken by the independent dredge operators was based on aerial photographs marked by the

witnesses as to locations of removal, and estimates of quantities removed between low watermarks in each parcel and between high water and low watermarks.

Proof was also introduced of the amounts of gravel taken by defendant with its own equipment and personnel. The defendant furnished the state its ledger records which had been prepared on a monthly basis for the period July 1, 1959, to December 31, 1970. Raw production totals of materials were shown from the year 1959 through 1970. The state then estimated that at least 50 percent of the amount of the raw materials production came from the riverbed. Adequate evidence was introduced to support this 50 percent figure.

Combining the figures introduced, the following totals were obtained: Parcel 1: 757,588.3 cubic yards (the trial court found 574,000 cubic yards had been removed); Parcels 2A, 2B and 2C: 104,964.9 cubic yards (the trial court awarded these parcels to the defendant); Parcel 3: 120,468.6 cubic yards (the trial court found that 56,000 cubic yards had been taken out prior to July of 1963); Parcel 5: 11,506.4 cubic yards (the trial court found 9,000 cubic yards had been removed); Parcel 6: 26,427.1 cubic yards (the trial court found that 21,000 cubic yards had been removed).

There is evidence to support the trial court's finding in regard to Parcels 1, 5 and 6.

There is a substantial question raised with regard to Parcel 3. While the evidence introduced by the state showed that over 120,000 cubic yards had been removed, the state makes no claim for these amounts since they relate to material taken subsequent to July 1, 1963,

and thus were covered by the lease between the parties. The state, however, argues that the trial court's award of 56,000 cubic yards should be affirmed on the basis that if the court chose to disbelieve defendant's testimony that it had not dredged in the area of Parcel 3 prior to July 1, 1963, the court was certainly at liberty to do so. There is no evidence in the record to support the assertion that any materials were taken from Parcel 3 prior to July 1, 1963, the effective date of the lease, let alone the 56,000 cubic-yard total found by the trial court. The fact that defendant admitted operating in certain portions of the river does not form an adequate basis for the conclusion that it removed the amount found by the trial court prior to July of 1963. This portion of the judgment must be reversed.

V. Interest on Damages

The trial court awarded the state $82,500 in damages for the reasonable value of the use of plaintiff's premises by defendant for the period June 7, 1959, to May 19, 1972. Interest was awarded only from the date of judgment because the damages were "unliquidated." The state contends that it was entitled as of right to interest as part of its damages.[1]

The majority of jurisdictions allow interest as part of the damages for the detention of land in ejectment and other actions to gain possession of the land,

[1] Interest is provided by ORS 82.010:

"(1) The legal rate of interest is six per cent per annum and is payable on:

"* * * * *

"(b) Judgments and decree for the payment of money from the date of the entry thereof unless some other date is specified therein * * *."

such interest to run from the date of taking. Annotation, 36 ALR2d 337, 354 (1954). However, the Oregon courts have specifically stated in *Meyer v. Harvey Aluminum*, 263 Or 487, 501 P2d 795 (1972), that interest is not allowable on unliquidated damages. Damages are unliquidated

> "* * * where they are an uncertain quantity, depending on no fixed standard, referred to the wide discretion of a jury, and can never be made certain except by accord or verdict." 25 CJS 615, 626, Damages § 2.

While it is not always easy to categorize damages as "liquidated" or "unliquidated," we hold that in the case at bar the damages fall into the "unliquidated" category. In *Rose City Transit v. City of Portland*, 99 Adv Sh 1187, — Or App ——, — P2d — (1974), we allowed interest from the date of the taking of the property in question. However, in *Rose City*, unlike in the case at bar, the amount and nature of the property taken, the time of taking and the ownership prior to the taking were not at issue. Here, there was active litigation on the amount and location of gravel removed and the ownership of the bed from which the gravel was removed, as well as the value of the gravel removed. In light of all these factors which had to be determined by the finder of fact, it cannot be said that these damages were a sum to be paid in lieu of performance of the contract. *See, Medak v. Hekimian*, 241 Or 38, 404 P2d 203 (1965). This portion of the trial court's order is affirmed.

VI. Deposition of the State's Expert

On September 20, 1971, defendant filed a motion seeking an order directing that defendant be able to

take the deposition of Ronald McReary, the state's expert witness. Defendant further requested that the expert answer all questions put to him relative to the issues of the case and particularly his opinions as to the grounds on which the state claimed ownership of each of the parcels of real property described in the complaint. Further, defendant sought to have the expert produce for examination all physical material, reports, photographs, and other physical evidence from which he obtained such facts forming the basis of his opinion. Argument on the motion was heard on September 24, 1971. However, defendant has not designated the transcript of said arguments as part of the record before this court. The trial court denied defendant's motion to depose the expert, but did allow it to have access to relevant supporting data and information upon which the expert based his opinion.

Depositions of expert witnesses are allowed by ORS 45.151. However, the right to take a deposition may be limited:

> "After notice is served for taking a deposition upon motion seasonably made by any party * * * and upon notice and for good cause shown, the court in which the action, suit or proceeding is pending may make an order that the deposition shall not be taken * * * or that certain matters shall not be inquired into, or that the scope of the examination shall be limited to certain matters * * *." ORS 45.181.

It is clear that the federal rules of civil procedure relating to discovery and depositions served as a model for the Oregon rules. *Richardson-Merrell, Inc. v. Main,* 240 Or 533, 402 P2d 746 (1965). Under the federal rules, and, thus, by implication the Oregon

rules, the granting or denial of a protective order is within the discretion of the trial court. *See,* 8 Wright and Miller, Federal Practice & Procedure 267, § 2036 (1970). And, since it is discretionary, only an abuse of that discretion would be cause for reversal. *General Dynamics Corp. v. Selb Manufacturing Co.,* 481 F2d 1204 (8th Cir 1973). In the absence of a transcript of the oral argument or a showing of a basis of the court's ruling, there is no way this court can say that the trial court abused its discretion and that "good cause" has not been shown.

VII. Splitting of Area into 11 Parcels

In its original complaint, the state described the disputed property as one tract. In its first amended complaint the state split the disputed property into 11 separate parcels and alleged a separate cause of action as to each parcel. The defendant moved to strike the first amended complaint, demurred to it and set up as affirmative defenses both in bar and abatement of the state's alleged arbitrary splitting of a single cause of action.

The "splitting of a cause of action" consists in the commencement of an action for only a part of a cause of action. *Wood et ux v. Baker et ux,* 217 Or 279, 284, 341 P2d 134 (1959). And, as a general rule, an entire cause of action cannot be divided to be made the subject of two or more actions. 1 Bancroft, Code Practice and Remedies 586, § 384 (1927). One reason for the general prohibition against the splitting of a cause of action is stated in 1 Bancroft, supra at 586-87:

> "* * * If the rule were otherwise, one could split his demand into innumerable parts, thereby

> multiplying litigation and adding indefinitely to the costs. Moreover, the law does not favor a multiplicity of suits, and requires that all the matters in controversy between parties which may fairly be included in one action be so included."

Accord, Wood et ux v. Baker et ux, supra. Likewise, in *Coos Bay Oyster Coop. v. Highway Com.,* 219 Or 588, 348 P2d 39 (1959), cited by defendant, the court notes that:

> "* * * Allowance of separate actions for fractional claims would inevitably result in the pyramiding, duplicating and overlapping of damage items to the detriment of the condemnor * * *." 219 Or at 594.

Defendant contends that the state's splitting of its case into 11 separate claims made the case unduly complicated, and was done solely for the convenience of the state's expert witness. Applying the policy reasons for avoiding the splitting of a cause of action to the facts of this case, it becomes clear that none of the hazards sought to be protected against were present here. First, all of these causes of action were presented in a single complaint, so there was no danger of the defendant's being harassed by a multiplicity of suits. At the conclusion of the lawsuit, the limits of the property in question, its ownership, and damages, would be determined. As the court noted in *Wood et ux v. Baker et ux,* supra at 285, where there is no question of a multiplicity of suits there is no violation of the rule against splitting a cause of action. Second, splitting of the one parcel into 11 separate parcels reflects more nearly the various geographical differences and historical origins of the parcels involved. Rather than harassing the defendant, such splitting would make it

easier for the factual differences between the parties to be settled.

While *Coos Bay Oyster Coop. v. Highway Com.,* supra, cited by defendant, does support the proposition that interests in land cannot be split into fractional claims, that case involved the attempt to split one interest in real property into several subinterests; this was not the result here. Also, *Coos Bay* must be evaluated in light of the policy determinants behind the prohibition of a splitting of the cause of action. Viewed in this light, we do not find the splitting of the land in question into 11 separate parcels, each the subject of a cause of action, to be improper.

VIII. Prescriptive Rights

The defendant alleges that the company had, continuously since 1920, conducted sand and gravel removal operations from the disputed portions of the Willamette River, which removal had been open, continuous, notorious, hostile, exclusive and adverse to the state, and had been known to the state since 1933. The defendant contends that this removal results in the defendant's acquiring an irrevocable property right to remove sand and gravel from the disputed property. The defendant contends that this property right is one of prescription.

There is some authority that a state may lose rights to property through prescription. As noted in 1 Farnham, Waters and Water Rights 225, § 45b:

> "Where the land under tide water may be granted by the state, no reason exists why a private individual cannot establish title under the theory of lost grant. * * * [R]ecords may become lost,

> and it is unreasonable to require the original grant to be produced in all cases. Therefore the presumption of grant may be raised by long possession accompanied by acts of ownership * * *."

However, it is important to note that this prescriptive right is limited:

> "* * * If the law prohibits the grant of the tide land, no title can be acquired by adverse possession, since no grant can be presumed * * *." 1 Farnham, supra at 226.

Between 1878 and 1963, there was no statutory provision by which the state could grant title to any nontidal portion of the Willamette River. *See, State v. McVey,* supra; *Corvallis Sand & Gravel v. Land Board,* supra. The authority of the state to grant title to submerged and submersible lands in the Willamette River in the Corvallis area arose after 1963. Since the state has been actively contesting defendant's possession of these parcels since 1958, it is impossible for defendant to contend that there has been a "lost grant" prior to 1963. No prescriptive rights arose against the state.

IX.

Defendant raises several assignments of error which need only brief mention. First, it contends that ejectment will not lie to recover the possession of land under water. This question has, by implication, been decided adversely to defendant's claim in *Corvallis Sand & Gravel v. Land Board,* supra. *See also, Lowndes v. Huntington,* 153 US 1, 14 S Ct 758, 38 L Ed 615 (1894); *Bates v. Illinois Central Railroad Company,* 66 US (1 Black) 204, 17 L Ed 158 (1861).

Defendant's argument that estoppel and acquiescence in the trespass should apply against the state in this case was also decided adversely to defendant's position in *Corvallis Sand & Gravel Co. v. Land Board,* supra, 250 Or at 328-29. The same policy considerations that militated against the allowance of the defense of laches in that case apply alike to the defense of estoppel and acquiescence.

Defendant's argument that the statute of limitations applies is without support. ORS 12.250.[9]

Finally, defendant raises certain constitutional challenges to both the ejectment statutes, ORS 105.005, et seq, and the ejectment proceeding as a whole. Both of these points could have been raised in the earlier challenge to the proceeding in *Corvallis Sand & Gravel Co. v. Land Board,* supra, but were not. Even assuming that these arguments are meritorious, defendant is foreclosed from raising them now.

In sum, we affirm the judgment of the trial court in all respects with the exception of the award of damages for Parcel 3, which award we reverse.

Affirmed in part; reversed in part.

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[9] "Unless otherwise made applicable thereto, the limitations prescribed in this chapter shall not apply to actions brought in the name of the state, or any county, or other public corporation therein, or for its benefit." ORS 12.250.

OREGON SUPREME COURT CLERK'S LETTER

FEBRUARY 28, 1975

RE ACCEPTANCE OF REVIEW

LOREN D. HICKS
State Court Administrator

January 28, 1975

Mr. Peter S. Herman
Senior Counsel
State Office Building
Salem, Oregon 97310

Mr. Robert Mix
Attorney at Law
745 N. W. VanBuren
Corvallis, Oregon 97330

Re: State ex rel State Land Board v.
Corvallis Sand & Gravel Company

Gentlemen:

With Justice Thomas Tongue not participating, the Supreme Court today allowed defendant's petition for review and denied plaintiff's petition for review in the above case.

The matter will be set for argument the first week of March and you will receive later notification of the exact day and time.

Very truly yours,

ADELL JOHNSON
Adell Johnson
Assistant Administrator

AJ/t

IN THE SUPREME COURT OF THE STATE OF OREGON

No. 1940—June 12, 1975

State of Oregon, Acting by and through
the State Land Board,

Respondent-Cross-Petitioner,

v.

Corvallis Sand and Gravel Company,
an Oregon corporation,

Petitioner.

On Review from the Court of Appeals.

Argued and submitted April 3, 1975.

Robert Mix, Corvallis, argued the cause and filed the briefs for petitioner.

Peter S. Herman, Senior Counsel, Salem, argued the cause for respondent and cross-petitioner. With him on the briefs were Lee Johnson, Attorney General, and W. Michael Gillette, Solicitor General, Salem.

Before O'Connell, Chief Justice, and McAllister, Denecke, Holman, Howell and Bryson, Justices.

HOWELL, J.

Affirmed as modified.

HOWELL, J.

This is an action in ejectment brought by the state pursuant to ORS 105.005 et seq. The state sought to obtain possession of the Willamette riverbed in the Corvallis area and damages for the reasonable value of the defendant's use of portions of that riverbed. The trial

court awarded to the defendant certain portions of the riverbed within an area known as Fischer Cut and awarded other disputed portions to the state. Both parties appealed the judgment of the trial court to the Court of Appeals. The Court of Appeals affirmed the trial court's division of the parcels of land involved but reversed the trial court's award of damages for defendant's use of an area known as Parcel 3.

The history of this litigation and the numerous legal and factual issues are set forth in the opinion of the Court of Appeals, Land Bd. v. Corvallis Sand & Gravel, 99 Adv Sh 1532, — Or App ——, 526 P2d 469 (1974). We agree with the Court of Appeals that there was substantial evidence in the record to support either the theory that Fischer Cut of the Willamette was formed by an "avulsive" process or by the "exception to the accretion rule" process as described by the federal court in Commissioners v. United States, 270 F 110, 113-14 (8th Cir 1920). We accepted defendant's petition for review solely on the question concerning the length of the Fischer Cut area through which the Willamette River has coursed since a major flood in 1909.

The trial court made the following findings regarding Fischer Cut:

"1. Fischer Island from 1853 to 1909 was a peninsula-like formation around which the Willamette River coursed.

"2. By 1890 a clearly discernible overflow chan-

nel over the neck of the peninsula had developed known as Fischer Cut.

"* * * * *.

"4. In January of 1906 the Fischer Cut Channel was in practically the same location as it was in 1890. It was estimated then that roughly one-quarter of the flow of the river was carried through Fischer Cut.

"* * * * *.

"6. As a result of a flood of November 25, 1909, the river suddenly and with great force and violence converted Fischer Cut into the main channel of the river.

"7. The change was not gradual and imperceptible, but was a rapid and violent change of course, avulsive in character and constituted an avulsion.

"* * * * *."

The trial court awarded Parcels 2A, 2B and 2C to the defendant. Those parcels lie between the lines of ordinary high water and encompass a riverbed distance of 1250 feet. In addition to this award, the trial court added to the length of riverbed awarded to the defendant the area downstream from the end of Parcels 1A, 2B and 2C to the confluence of the East River Channel and the Willamette River. This area came from part of Parcel 3 and was made, as the state conceded at oral argument, on the basis of the statutory grants available to riparian owners between 1874 and 1878.

On appeal to this court, the state maintains that the trial court's findings regarding the length of Fischer Cut are correct. However, Corvallis Sand & Gravel contends that Fischer Cut is 3200 feet in length and that the trial court's finding of the length of the cut is not supported by the evidence.

The evidence concerning the length of Fischer Cut consists of various documents and testimony. The asserted 1250-foot length of Fischer Cut coincides with the linear riverbed distance of Parcels 2A, 2B and 2C which the state first claimed in its 1969 complaint. The state argues that portions of the Fischer Cut area eroded away between 1890 and the 1909 flood. At trial, the state's expert witness, Ronald McReary, utilized a 1936 aerial photograph to point out an alleged cutbank on the upstream side of Parcels 2A, and 2B, thus suggesting that the Cut was only 1250 feet long. The state also relied upon the testimony of one of its witnesses, Fred Fischer, who, as a boy, roamed through the area of Fischer Cut and who testified that the Willamette River moved east and took several acres of land with it. However, the state, in attempting to prove its erosion theory and the 1250-foot figure, relies on documentary evidence showing the area *after* the 1909 flood. Further, Mr. Fischer's testimony, taken as a whole, fails to explain whether the erosion he referred to occurred before or after 1909.

The evidence that Fischer Cut at the time of the

1909 flood was 3200 feet in length is substantial and highly persuasive. The trial court found that in 1906 the Fischer Cut was in practically the same location as it was in 1890 and that until 1909 the Willamette River continued to flow around Fischer Island. In 1890 the U.S. Army Corps of Engineers carefully mapped this stretch of the Willamette River, including the area of Fischer Cut. The 1890 Clapp map shows the existence of an overflow channel in the Fischer Island area. Both parties stated that this map was carefully drawn and prepared. The scale shows that the overflow channel from "upstream" to "downstream" points is approximately 3200 feet in length.

Later, in 1906, three years before the flood, Major G. W. Roessler of the Corps of Engineers sent Assistant Engineer David B. Ogden to examine the overflow channel in the area of what today is known as Fischer Island. Ogden's report to Roessler states, in pertinent part:

> "The channel in question is across the neck of a peninsula and is some 3200 feet long, while the distance around by the main river is two and one-quarter miles.
>
> "This channel has existed for a number of years as maps on file in this office show it in practically the same location in 1890, though the mouth of the channel was then closed by a gravel bar. The fall from its head to its food (sic) is noted as about 8 feet.

The approximate present location is shown in dotted lines on the sketch herewith."[1]

In addition, the state's witness stated on cross-examination:

> "* * * I would say the best evidence of it [the length of the eroded chute] is the distance shown on the map of 1890 which appears to be a very carefully prepared and well-engineered drawing and I would say that that is the length of the gully that eventually eroded into what is now the bed of the river."

We find that the best evidence of the length of Fischer Cut at the time of the 1909 flood is the 1890 map, which both parties agreed was carefully prepared and which shows Fischer Cut to be approximately 3200 feet in length.

It is difficult, based on the present record, to correlate the length of Fischer Cut in 1909 to the topography as is existed at the time of trial. We do find, however, that the length of Fischer Cut as it existed in 1909 at the time of the flood is best represented by the channel from point A to point B as shown on the 1890 map. We remand this action to the Court of Appeals with directions to remand to the trial court to correlate points

[1] The distance on the sketch accompanying the engineer's report scales at slightly less than the 3200 feet stated in the body of the letter. However, the 1906 sketch did not purport to represent the exact length of the cutoff or overflow channel, only its approximate location.

A and B with the present topography of the area. Additional testimony may be taken if necessary. Also, on the remand, the trial court should modify or adjust any damages in accordance with our decision herein expanding the length of Fischer Cut. In all other respects the decision of the Court of Appeals is affirmed.

Affirmed as modified.

IN THE SUPREME COURT OF THE STATE OF OREGON

No. 1940—July 17, 1975

In Banc*

State of Oregon, Acting by and through
the State Land Board,

Respondent-Cross-Petitioner,

v.

Corvallis Sand and Gravel Company,
an Oregon corporation,

Petitioner.

On review from the Court of Appeals.

Upon respondent-cross-petitioner's petition for rehearing filed June 20, 1975, and petitioner's petition for rehearing filed July 3, 1975.

Lee Johnson, Attorney General, W. Michael Gillette, Solicitor General, and Peter S. Herman, Senior Counsel, Salem, for the respondent-cross-petitioner.

Robert Mix, Corvallis, for the petitioner.

HOWELL, J.

Petitions for rehearing denied; original opinion clarified.

HOWELL, J.

In our original opinion we emphasized that we accepted the defendant's petition for review of the decision of the Court of Appeals on the sole issue of the length of Fischer Cut as it existed at the time of the

*Tongue, J., did not participate in this decision.

1909 flood. We held that the length of Fischer Cut as it existed in 1909 was best represented by the channel from Point A to Point B as shown on the 1890 map and remanded the cause with directions to the trial court to correllate Points A and B with the present topography of the area and to modify or adjust any damages accordingly.

Both parties have filed petitions for rehearing. The defendant's petition raises no new matter and is denied. The petition of the plaintiff, the State of Oregon, expresses concern that our opinion could be interpreted to include as an award to defendant a portion of the riverbed in Parcel 3 which the plaintiff leased to the defendant in 1963 and which defendant has admitted in its pleadings that it had no ownership therein.[1]

To prevent any misunderstanding, our former opinion is clarified to the following extent: if correlating Points A and B of Fischer Cut results in any portion of that length falling within a portion of the riverbed to which the defendant has disclaimed ownership, then the ownership of plaintiff remains unaffected.

Both petitions for rehearing are denied.

[1] The plaintiff leased to defendant "That portion of the bed of the Willamette River owned and controlled by the State of Oregon *beginning at its confluence with East River (East Channel of the Willamette River) and extending downstream* 4000 feet all in section 2 Township 12 South Range 5 West Willamette Meridian." (Emphasis supplied)

The defendant's amended answer alleged: "Defendant is the owner in fee simple of the property described in defendant's amended complaint, *except that defendant does not own that portion leased by plaintiff to defendant* * * *." (Emphasis supplied)

STATE OF OREGON
SUPREME COURT

Mandate

STATE OF OREGON, Acting by and through the STATE LAND BOARD, Respondent, Cross-Petitioner v. CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation, Petitioner	))))))))	Appeal from BENTON County On Review from Court of Appeals

This cause on April 3, 1975, having been duly argued and submitted upon the sole issue arising on defendant's petition for review from the Court of Appeals, and the court having fully considered said issue as well as suggestions of counsel in their argument and brief finds that the decision of the Court of Appeals should be affirmed as modified.

IT THEREFORE IS ORDERED and ADJUDGED that the decision of the Court of Appeals is affirmed as modified and the cause is remanded to the Court of Appeals with directions to remand to the trial court for further proceedings in conformity with the opinions of the court herein.

ENTERED at Salem, Oregon, this 12th day of June, 1975.

STATE OF OREGON
COURT OF APPEALS

STATE OF OREGON, Acting by and through the STATE LAND BOARD, Appellant–Cross-Respondent, v. CORVALLIS SAND AND GRAVEL COMPANY, an Oregon corporation, Respondent–Cross-Appellant.	))))))))	JUDGMENT and MANDATE Appeal from BENTON County No. 21512

This cause having come on to be heard on appeal and the court having found that the decision of the court below should be affirmed in part and reversed in part, and subsequently the cause having gone to the Supreme Court on Petition for Review and said court on *June 12, 1975 having affirmed as modified the decision of this court and entered its mandate as attached:*

NOW THEREFORE, IT IS ORDERED and ADJUDGED that the decision entered below is affirmed in part, reversed in part and modified in part and the cause is remanded to the trial court for further proceedings in conformity with the opinions of the Supreme Court and the Court of Appeals.

IT IS FURTHER ORDERED that respondent–cross-appellant recover from appellant–cross-respondent damages, costs and disbursements in this court in the amount of $40.

ISSUED at Salem, Oregon: AUG. 12, 1975.